

February 11, 2013

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn:

Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for January 2013



FEB 13 2013

UIC BRANCH EPA, REGION 5

During the month of January, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 31 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 26 days this month.
- Cavity KCI 1060 was in operation for 31 days this month.
- Cavity KCI 2030 was in operation for 31 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 31 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Production/Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely.

Doug Patulski

Production/Minefield Superintendent

Karl Tomaszewski

Site Manager

**Attachments** 



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### Daily Averages

	Injection	Injection	Return
Date		Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-13	shut in	shut in	shut in
2-Jan-13	shut in	shut in	shut in
3-Jan-13	shut in	shut in	shut in
4-Jan-13	shut in	shut in	shut in
5-Jan-13	shut in	shut in	shut in
6-Jan-13	shut in	shut in	shut in
7-Jan-13	shut in	shut in	shut in
8-Jan-13	shut in	shut in	shut in
9-Jan-13	shut in	shut in	shut in
10-Jan-13	shut in	shut in	shut in
11-Jan-13	shut in	shut in	shut in
12-Jan-13	shut in	shut in	shut in
13-Jan-13	shut in	shut in	shut in
14-Jan-13	shut in	shut in	shut in
15-Jan-13	shut in	shut in	shut in
16-Jan-13	shut in	shut in	shut in
17-Jan-13	shut in	shut in	shut in
18-Jan-13	shut in	shut in	shut in
19-Jan-13	shut in	shut in	shut in
20-Jan-13	shut in	shut in	shut in
21-Jan-13	shut in	shut in	shut in
22-Jan-13	shut in	shut in	shut in
23-Jan-13	shut in	shut in	shut in
24-Jan-13	shut in	shut in	shut in
25-Jan-13	shut in	shut in	shut in
26-Jan-13	shut in	shut in	shut in
27-Jan-13	shut in	shut in	shut in
28-Jan-13	shut in	shut in	shut in
29-Jan-13	shut in	shut in	shut in
30-Jan-13	shut in	shut in	shut in
31-Jan-13	shut in	shut in	shut in



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Cavity 1020

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	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Jan-13	V 1080	103	116	
2-Jan-13	1050	109	133	
3-Jan-13	1040	116	131	
4-Jan-13	1042	112	122	
5-Jan-13	1048	116	124	
6-Jan-13	1079	101	109	
7-Jan-13	1014	152	201	
8-Jan-13	970	165	173	
9-Jan-13	983	142	145	
10-Jan-13	985	145	175	
11-Jan-13	981	√ <b>167</b>	208	
12-Jan-13	1002	164	150	
13-Jan-13	1051	142	138	
14-Jan-13	1059	119	132	
15-Jan-13	1037	122	128	
16-Jan-13	1029	122	133	
17-Jan-13	994	105	155	
18-Jan-13	977	122	139	
19-Jan-13	990	123	134	
20-Jan-13	995	104	117	
21-Jan-13	995	118	120	
22-Jan-13	998	128	130	
23-Jan-13	1015	115	74	
24-Jan-13	1023	121	150	
25-Jan-13	1009	125	148	
26-Jan-13	1003	130	149	
27-Jan-13	1006	127	147	
28-Jan-13	1000	127	142	
29-Jan-13	965	149	153	
30-Jan-13	966	136	154	
31-Jan-13	963	140	158	



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Jan-13 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1011

128

142

Maximum Injection Pressure and corresponding Injection Flow

Date 1-Jan-13 Injection Pressure (psi)

Injection Flow (gpm)

1080

103

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

31-Jan-13

963

140

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

11-Jan-13

Injection Flow (gpm)

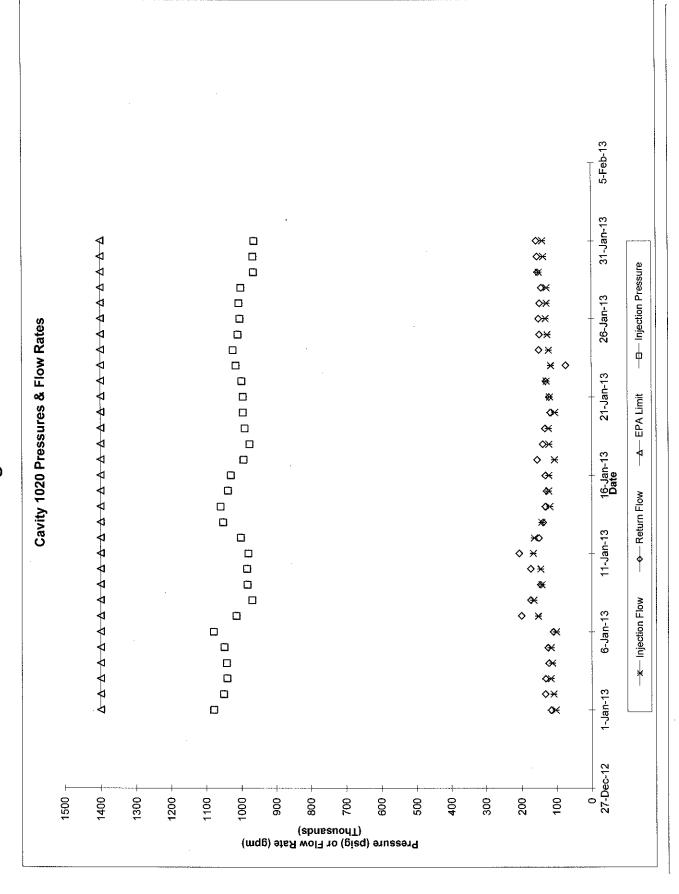
Injection Pressure (psi)

167

981



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### Daily Averages

	Injection		Injection		Return
Date	Pressure		Flow		Flow
	(psi)		(gpm)		(gpm)
1-Jan-13	shut in	shut in	shut in	shut in	shut in
2-Jan-13	shut in	shut in	shut in	shut in	shut in
3-Jan-13	shut in	shut in	shut in	shut in	shut in
4-Jan-13	shut in	shut in	shut in	shut in	shut in
5-Jan-13	shut in	shut in	shut in	shut in	shut in
6-Jan-13	shut in	shut in	shut in	shut in	shut in
7-Jan-13	shut in	shut in	shut in	shut in	shut in
8-Jan-13	shut in	shut in	shut in	shut in	shut in
9-Jan-13	shut in	shut in	shut in	shut in	shut in
10-Jan-13	shut in	shut in	shut in	shut in	shut in
11-Jan-13	shut in	shut in	shut in	shut in	shut ir
12-Jan-13	shut in	shut in	shut in	shut in	shut in
13-Jan-13	shut in	shut in	shut in	shut in	shut in
14-Jan-13	shut in	shut in	shut in	shut in	shut in
15-Jan-13	shut in	shut in	shut in	shut in	shut in
16-Jan-13	shut in	shut in	shut in	shut in	shut in
17-Jan-13	shut in	shut in	shut in	shut in	shut in
18-Jan-13	shut in	shut in	shut in	shut in	shut in
19-Jan-13	shut in	shut in	shut in	shut in	shut in
20-Jan-13	shut in	shut in	shut in	shut in	shut in
21-Jan-13	shut in	shut in	shut in	shut in	shut in
22-Jan-13	shut in	shut in	shut in	shut in	shut in
23-Jan-13	shut in	shut in	shut in	shut in	shut in
24-Jan-13	shut in	shut in	shut in	shut in	shut it
25-Jan-13	shut in	shut in	shut in	shut in	shut in
26-Jan-13	shut in	shut in	shut in	shut in	shut in
27-Jan-13	shut in	shut in	shut in	shut in	shut in
28-Jan-13	shut in	shut in	shut in	shut in	shut in
29-Jan-13	shut in	shut in	shut in	shut in	shut in
30-Jan-13	shut in	shut in	shut in	shut in	shut i
31-Jan-13	shut in	shut in	shut in	shut in	shut in



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Cavity 1050

	Injection	Injection	Return		
Date	Pressure	Flow	Flow		
	(psi)	(gpm)	(gpm)		
1-Jan-13	1118	125	125		
2-Jan-13	1175	101	101		
3-Jan-13	1167	113	113		
4-Jan-13	1145	132	132		
5-Jan-13	1105	117	117		
6-Jan-13	1150	117	117		
7-Jan-13	shut in	shut in	shut in		
8-Jan-13	shut in	shut in	shut in		
9-Jan-13	shut in	shut in	shut in		
10-Jan-13	shut in	shut in	shut in		
11-Jan-13	shut in	shut in	shut in		
12-Jan-13	1183	114	114		
13-Jan-13	1145	113	113		
14-Jan-13	1133	110	110		
15-Jan-13	1193	116	116		
16-Jan-13	1175	124	124		
17-Jan-13	1183	120	120		
18-Jan-13	1200	114	114		
19-Jan-13	1170	114	114		
20-Jan-13	1183	103	103		
21-Jan-13	1150	132	132		
22-Jan-13	1125	106	106		
23-Jan-13	1145	106	106		
24-Jan-13	1195	106	106		
25-Jan-13	1200	91	91		
26-Jan-13	1167	115	115		
27-Jan-13	1200	105	105		
28-Jan-13	1200	103	103		
29-Jan-13	1167	112	112		
30-Jan-13	V1250	106	106		
31-Jan-13	1175	106	106		



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Jan-13 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1169

112

112

Maximum Injection Pressure and corresponding Injection Flow

Date 30-Jan-13 Injection Pressure (psi)

Injection Flow (gpm)

1250

106

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

5-Jan-13

1105

117

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

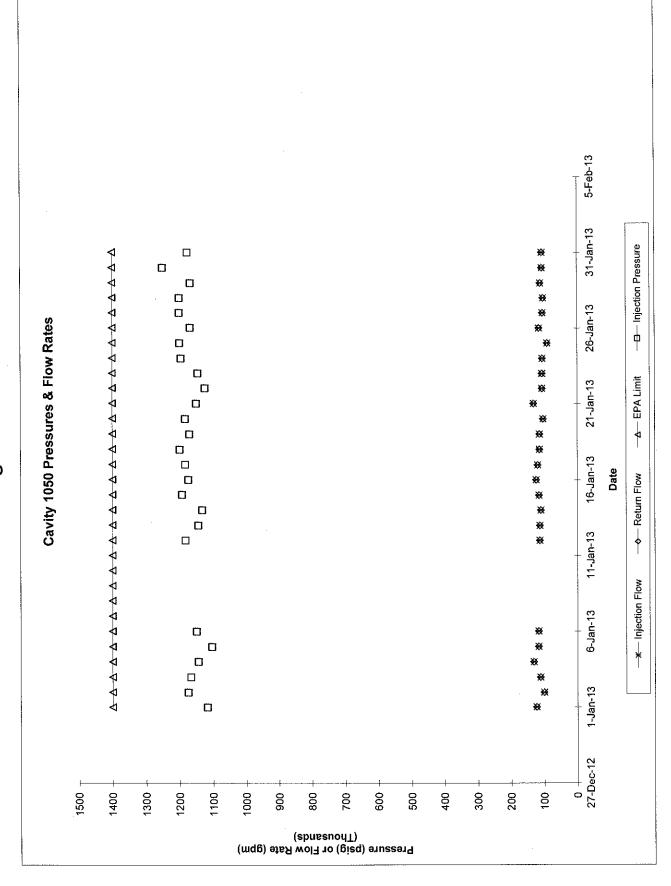
4-Jan-13

Injection Flow (gpm) 132 Injection Pressure (psi)

1145

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Cavity 1060

Date	Injection Pressure	Injection Flow	Return Flow
Date	(psi)	(gpm)	(gpm)
1-Jan-13	1080	278	281
2-Jan-13	1050	271	273
3-Jan-13	1040	271	276
4-Jan-13	1042	264	270
5-Jan-13	1048	278	283
6-Jan-13	1079	264	265
7-Jan-13	1014	271	261
8-Jan-13	970	257	249
9-Jan-13	983	285	273
10-Jan-13	985	299	276
11-Jan-13	981	278	246
12-Jan-13	1002	243	242
13-Jan-13	1051	243	246
14-Jan-13	1059	250	240
15-Jan-13	1037	264	229
16-Jan-13	1029	243	239
17-Jan-13	994	250	266
18-Jan-13	978	250	264
19-Jan-13	990	264	262
20-Jan-13	995	222	228
21-Jan-13	994	250	275
22-Jan-13	998	257	239
23-Jan-13	1015	236	256
24-Jan-13	1023	243	252
25-Jan-13	1009	243	243
26-Jan-13	1003	236	248
27-Jan-13	1006	243	236
28-Jan-13	1000	236	242
29-Jan-13	965	250	219
30-Jan-13	966	250	252
31-Jan-13	963	257	261



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Jan-13 Monthly Averages

Injection Pressure 1011 Injection Flow 256 Return Flow 255

Maximum Injection Pressure and corresponding Injection Flow

Date 1-Jan-13 Injection Pressure 1080 Injection Flow

278

Minimum Injection Pressure and corresponding Injection Flow

Date 31-Jan-13

Injection Pressure 963 Injection Flow

257

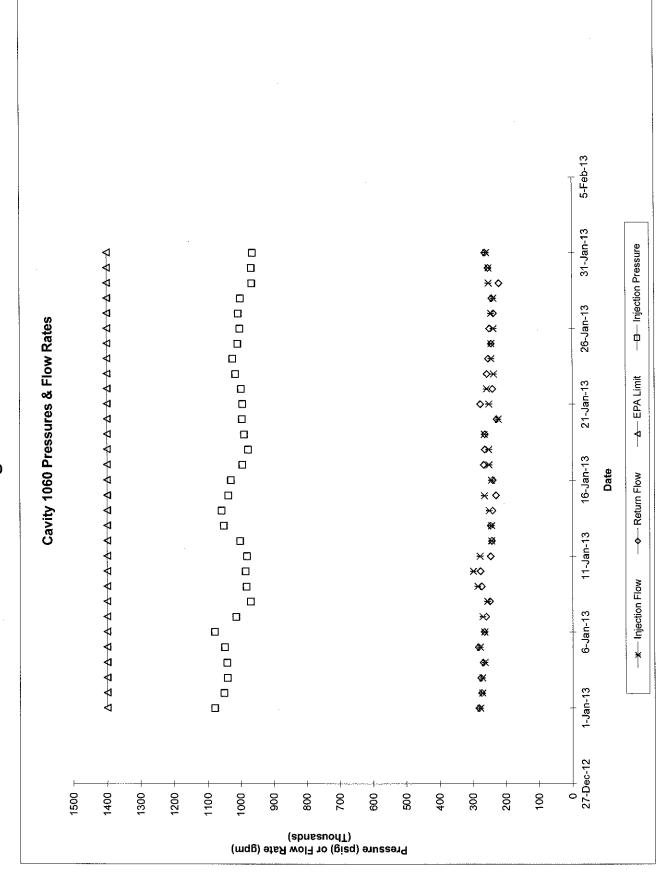
Maximum Injection Flow Rate and corresponding Injection Pressure

Date 10-Jan-13 Injection Flow 299 Injection Pressure

985



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- Cavity 2030

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Jan-13	1118	260	260
2-Jan-13	1175	290	290
3-Jan-13	1167	290	290
4-Jan-13	1145	271	271
5-Jan-13	1105	275	275
6-Jan-13	1150	260	260
7-Jan-13	1183	245	245
8-Jan-13	1175	311	311
9-Jan-13	1155	279	279
10-Jan-13	1168	278	278
11-Jan-13	1163	274	274
12-Jan-13	1175	275	275
13-Jan-13	1145	286	286
14-Jan-13	1133	264	264
15-Jan-13	1193	257	257
16-Jan-13	1175	252	252
17-Jan-13	1183	256	256
18-Jan-13	1200	273	273
19-Jan-13	1170	265	265
20-Jan-13	1183	255	255
21-Jan-13	1150	245	245
22-Jan-13	1125	279	279
23-Jan-13	1145	262	262
24-Jan-13	1195	260	260
25-Jan-13	1200	269	269
26-Jan-13	1163	271	271
27-Jan-13	1200	254	254
28-Jan-13	1200	259	259
29-Jan-13	1167	216	216
30-Jan-13	V 1250	276	276
31-Jan-13	1175	282	282



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Jan-13 Monthly Averages

Injection Pressure (psi) 1169

Injection Flow (gpm) 267

Return Flow (gpm)

267

Maximum Injection Pressure and corresponding Injection Flow

Date 30-Jan-13 Injection Pressure (psi) 1250

Injection Flow (gpm)

276

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

5-Jan-13

1105

275

Maximum Injection Flow Rate and corresponding Injection Pressure

Date 8-Jan-13 Injection Flow (gpm)

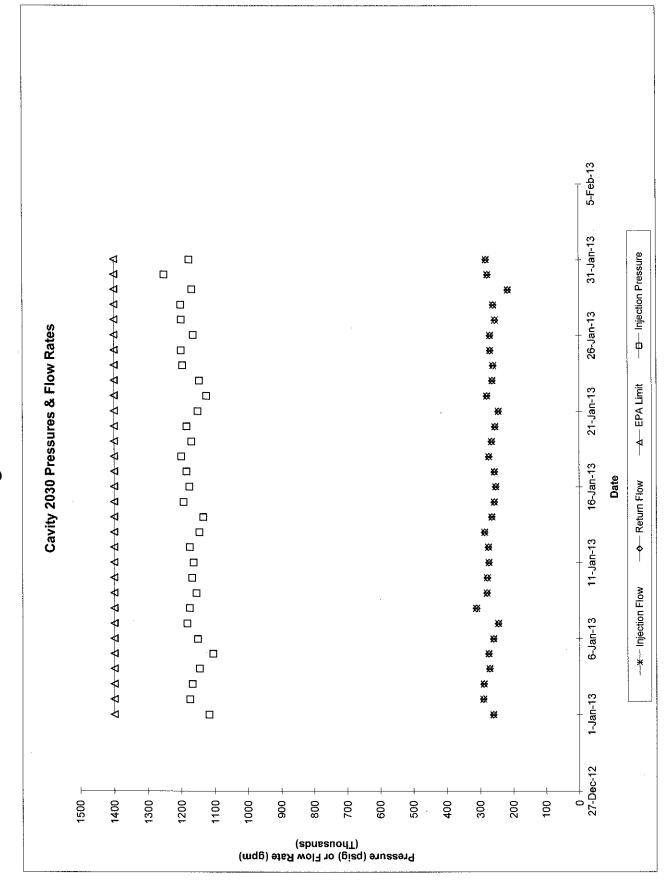
Injection Pressure (psi)

311

1175



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### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-13	shut in	shut in	shut in
2-Jan-13	shut in	shut in	shut in
3-Jan-13	shut in	shut in	shut in
4-Jan-13	shut in	shut in	shut in
5-Jan-13	shut in	shut in	shut in
6-Jan-13	shut in	shut in	shut in
7-Jan-13	shut in	shut in	shut in
8-Jan-13	shut in	shut in	shut in
9-Jan-13	shut in	shut in	shut in
10-Jan-13	shut in	shut in	shut in
11-Jan-13	shut in	shut in	shut in
12-Jan-13	shut in	shut in	shut in
13-Jan-13	shut in	shut in	shut in
14-Jan-13	shut in	shut in	shut in
15-Jan-13	shut in	shut in	shut in
16-Jan-13	shut in	shut in	shut in
17-Jan-13	shut in	shut in	shut in
18-Jan-13	shut in	shut in	shut in
19-Jan-13	shut in	shut in	shut in
20-Jan-13	shut in	shut in	shut in
21-Jan-13	shut in	shut in	shut in
22-Jan-13	shut in	shut in	shut in
23-Jan-13	shut in	shut in	shut in
24-Jan-13	shut in	shut in	shut in
25-Jan-13	shut in	shut in	shut in
26-Jan-13	shut in	shut in	shut in
27-Jan-13	shut in	shut in	shut in
28-Jan-13	shut in	shut in	shut in
29-Jan-13	shut in	shut in	shut in
30-Jan-13	shut in	shut in	shut in
31-Jan-13	shut in	shut in	shut in



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Cavity 2061

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Jan-13	1118	110	110
2-Jan-13	1175	82	82
3-Jan-13	1167	113	113
4-Jan-13	1145	112	112
5-Jan-13	1105	114	114
6-Jan-13	1150	83	83
7-Jan-13	1183	123	123
8-Jan-13	1175	135	135
9-Jan-13	1155	130	130
10-Jan-13	1168	131	131
11-Jan-13	1163	139	139
12-Jan-13	1175	133	133
13-Jan-13	1145	118	118
14-Jan-13	1133	83	83
15-Jan-13	1193	87	87
16-Jan-13	1175	101	101
17-Jan-13	1183	109	109
18-Jan-13	1200	106	106
19-Jan-13	1170	108	108
20-Jan-13	1183	135	135
21-Jan-13	1150	106	106
22-Jan-13	1125	108	108
23-Jan-13	1145	108	108
24-Jan-13	1195	106	106
25-Jan-13	1200	96	96
26-Jan-13	1163	92	92
27-Jan-13	1200	110	110
28-Jan-13	1200	103	103
29-Jan-13	1167	133	133
30-Jan-13	V1250	111	111
31-Jan-13	1175	107	107



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Jan-13 Monthly Averages

Injection Pressure (psi)

1169

Injection Flow (gpm)

111

Return Flow (gpm)

111

Maximum Injection Pressure and corresponding Injection Flow

Date

30-Jan-13

Injection Pressure (psi)

1250

Injection Flow (gpm)

111

Minimum Injection Pressure and corresponding Injection Flow

Date 5-Jan-13

Injection Pressure (psi)

1105

Injection Flow (gpm)

114

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

11-Jan-13

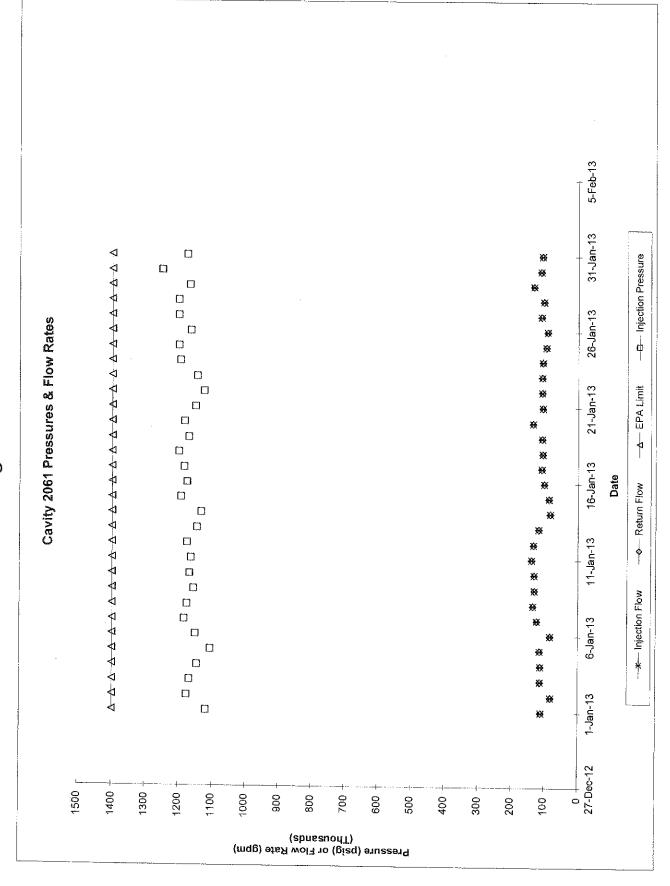
Injection Flow (psi)

Injection Pressure (psi)

139

1163





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Cavity 2062

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-13	shut in	shut in	shut in
2-Jan-13	shut in	shut in	shut in
3-Jan-13	shut in	shut in	shut in
4-Jan-13	shut in	shut in	shut in
5-Jan-13	shut in	shut in	shut in
6-Jan-13	shut in	shut in	shut in
7-Jan-13	shut in	shut in	shut in
8-Jan-13	shut in	shut in	shut in
9-Jan-13	shut in	shut in	shut in
10-Jan-13	shut in	shut in	shut in
11-Jan-13	shut in	shut in	shut in
12-Jan-13	shut in	shut in	shut in
13-Jan-13	shut in	shut in	shut in
14-Jan-13	shut in	shut in	shut in
15-Jan-13	shut in	shut in	shut in
16-Jan-13	shut in	shut in	shut in
17-Jan-13	shut in	shut in	shut in
18-Jan-13	shut in	shut in	shut in
19-Jan-13	shut in	shut in	shut in
20-Jan-13	shut in	shut in	shut in
21-Jan-13	shut in	shut in	shut in
22-Jan-13	shut in	shut in	shut in
23-Jan-13	shut in	shut in	shut in
24-Jan-13	shut in	shut in	shut in
25-Jan-13	shut in	shut in	shut in
26-Jan-13	shut in	shut in	shut in
27-Jan-13	shut in	shut in	shut in
28-Jan-13	shut in	shut in	shut in
29-Jan-13	shut in	shut in	shut in
30-Jan-13	shut in	shut in	shut in
31-Jan-13	shut in	shut in	shut in



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January 1, 2013

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604 RECEIVED AND 2 2 2013

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Attn: Li

Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002

Monthly Report for December 2012

During the month of December, Mosaic Potash solution well operations were as follows:

- Cavity KCl 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 28 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 28 days this month.
- Cavity KCI 1060 was in operation for 5 days this month.
- Cavity KCl 2030 was in operation for 28 days this month.
- Cavity KCl 2040 was not in operation for this month.
- Cavity KCl 2061 was in operation for 28 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Production/Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Production/Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments



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### Daily Averages

	Injection	Injection	Return
Date	Pressure Flow	Flow	
	(psi)	(gpm)	(gpm)
1-Dec-12	shut in	shut in	shut in
2-Dec-12	shut in	shut in	shut in
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	shut in	shut in	shut in
6-Dec-12	shut in	shut in	shut in
7-Dec-12	shut in	shut in	shut in
8-Dec-12	shut in	shut in	shut in
9-Dec-12	shut in	shut in	shut in
10-Dec-12	shut in	shut in	shut in
11-Dec-12	shut in	shut in	shut in
12-Dec-12	shut in	shut in	shut in
13-Dec-12	shut in	shut in	shut in
14-Dec-12	shut in	shut in	shut in
15-Dec-12	shut in	shut in	shut in
16-Dec-12	shut in	shut in	shut in
17-Dec-12	shut in	shut in	shut in
18-Dec-12	shut in	shut in	shut in
19-Dec-12	shut in	shut in	shut in
20-Dec-12	shut in	shut in	shut in
21-Dec-12	shut in	shut in	shut in
22-Dec-12	shut in	shut in	shut in
23-Dec-12	shut in	shut in	shut in
24-Dec-12	shut in	shut in	shut in
25-Dec-12	shut in	shut in	shut in
26-Dec-12	shut in	shut in	shut in
27-Dec-12	shut in	shut in	shut in
28-Dec-12	shut in	shut in	shut in
29-Dec-12	shut in	shut in	shut in
30-Dec-12	shut in	shut in	shut in
31-Dec-12	shut in	shut in	shut in



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Cavity 1020

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Dec-12	1119	283	363
2-Dec-12	1094	159	201
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	1019	48	81
6-Dec-12	shut in	shut in	shut in
7-Dec-12	1143	299	287
8-Dec-12	1187	295	319
9-Dec-12	1151	285	311
10-Dec-12	1093	324	358
11-Dec-12	1072	339	349
12-Dec-12	1065	343	372
13-Dec-12	1025	348	375
14-Dec-12	1038	353	375
15-Dec-12	1038	347	368
16-Dec-12	1053	344	361
17-Dec-12	1075	353	383
18-Dec-12	1046	371	391
19-Dec-12	1075	341	356
20-Dec-12	1113	331	343
21-Dec-12	1130	326	349
22-Dec-12	1048	326	371
23-Dec-12	1111	359	378
24-Dec-12	1124	342	358
25-Dec-12	1040	334	371
26-Dec-12	969	233	300
27-Dec-12	983	108	112
28-Dec-12	1017	118	90
29-Dec-12	1040	85	127
30-Dec-12	1050	99	110
31-Dec-12	1074	103	119



JAN 2 2 2013

Dec-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1071

271

296

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

8-Dec-12

1187

295

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

26-Dec-12

969

233

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

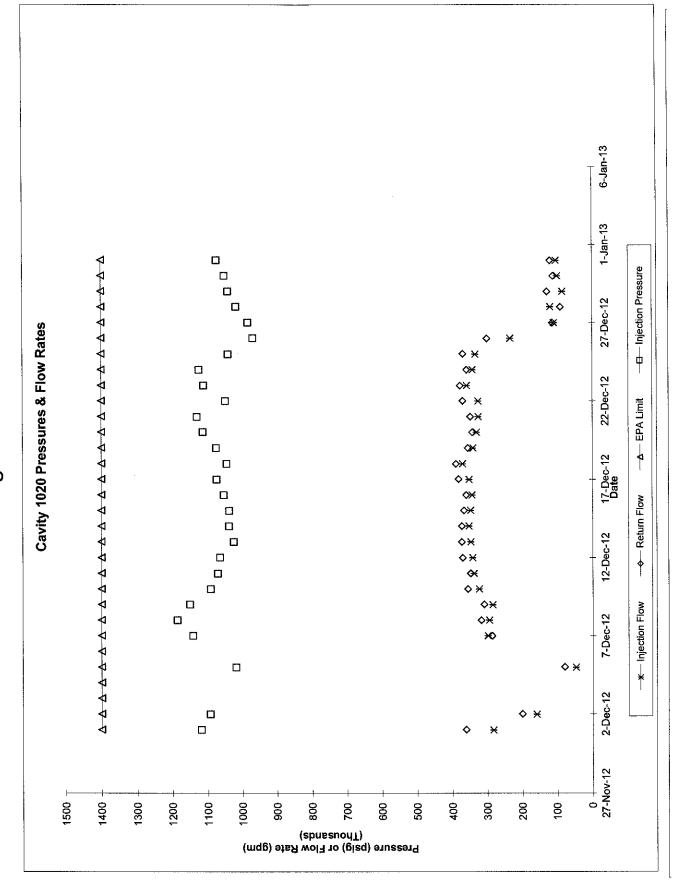
18-Dec-12

371

1046



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### Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Dec-12	shut in	shut in	shut in	
2-Dec-12	shut in	shut in	shut in	
3-Dec-12	shut in	shut in	shut in	
4-Dec-12	shut in	shut in	shut in	
5-Dec-12	shut in	shut in	shut in	
6-Dec-12	shut in	shut in	shut in	
7-Dec-12	shut in	shut in	shut in	
8-Dec-12	shut in	shut in	shut in	
9-Dec-12	shut in	shut in	shut in	
10-Dec-12	shut in	shut in	shut in	
11-Dec-12	shut in	shut in	shut in	
12-Dec-12	shut in	shut in	shut in	
13-Dec-12	shut in	shut in	shut in	
14-Dec-12	shut in	shut in	shut in	
15-Dec-12	shut in	shut in	shut in	
16-Dec-12	shut in	shut in	shut in	
17-Dec-12	shut in	shut in	shut in	
18-Dec-12	shut in	shut in	shut in	
19-Dec-12	shut in	shut in	shut in	
20-Dec-12	shut in	shut in	shut in	
21-Dec-12	shut in	shut in	shut in	
22-Dec-12	shut in	shut in	shut in	
23-Dec-12	shut in	shut in	shut in	
24-Dec-12	shut in	shut in	shut in	
25-Dec-12	shut in	shut in	shut in	
26-Dec-12	shut in	shut in	shut in	
27-Dec-12	shut in	shut in	shut in	
28-Dec-12	shut in	shut in	shut in	
29-Dec-12	shut in	shut in	shut in	
30-Dec-12	shut in	shut in	shut in	
31-Dec-12	shut in	shut in	shut in	



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Cavity 1050

### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Dec-12	1177	135	135
2-Dec-12	1200	95	95
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	1200	125	125
6-Dec-12	shut in	shut in	shut in
7-Dec-12	1177	173	173
8-Dec-12	1130	165	165
9-Dec-12	1130	173	173
10-Dec-12	1100	182	182
11-Dec-12	1183	172	172
12-Dec-12	1133	161	161
13-Dec-12	1187	159	159
14-Dec-12	1183	180	180
15-Dec-12	1170	181	181
16-Dec-12	1183	172	172
17-Dec-12	1153	184	184
18-Dec-12	1125	170	170
19-Dec-12	1200	148	148
20-Dec-12	1167	180	180
21-Dec-12	1200	172	172
22-Dec-12	1130	173	173
23-Dec-12	1133	154	154
24-Dec-12	1188	168	168
25-Dec-12	1175	1.67	167
26-Dec-12	1100	188	188
27-Dec-12	1125	120	120
28-Dec-12	/1200	133	133
29-Dec-12	1180	121	121
30-Dec-12	1188	125	125
31-Dec-12	1133	129	129



JAN 2 2 2013

Dec-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1163

157

157

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Dec-12

1200

95

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

10-Dec-12

1100

182

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

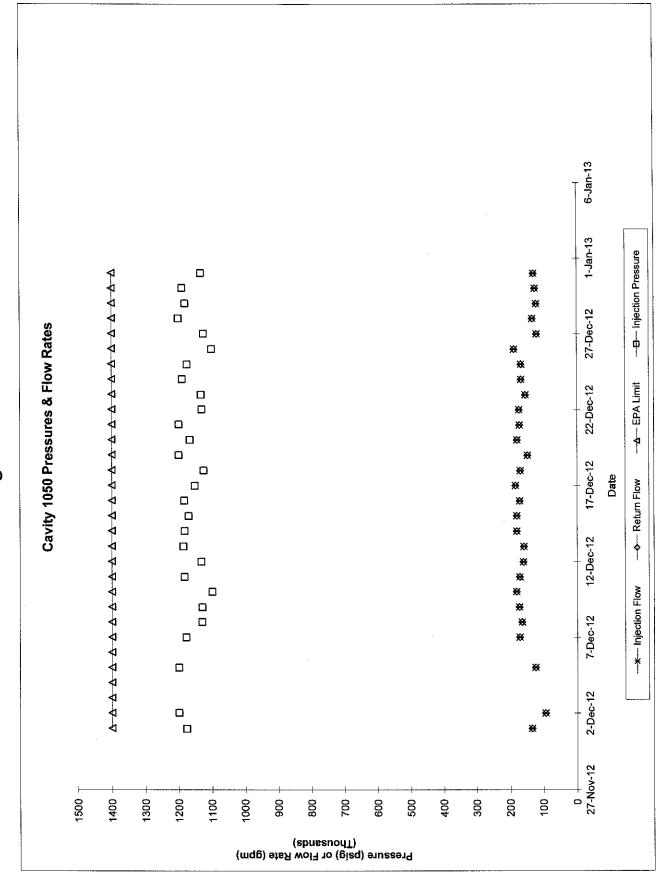
26-Dec-12

188

1100



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Cavity 1060

### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Dec-12	shut in	shut in	shut in
2-Dec-12	shut in	shut in	shut in
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	shut in	shut in	shut in
6-Dec-12	shut in	shut in	shut in
7-Dec-12	shut in	shut in	shut in
8-Dec-12	shut in	shut in	shut in
9-Dec-12	shut in	shut in	shut in
10-Dec-12	shut in	shut in	shut in
11-Dec-12	shut in	shut in	shut in
12-Dec-12	shut in	shut in	shut in
13-Dec-12	shut in	shut in	shut in
14-Dec-12	shut in	shut in	shut in
15-Dec-12	shut in	shut in	shut in
16-Dec-12	shut in	shut in	shut in
17-Dec-12	shut in	shut in	shut in
18-Dec-12	shut in	shut in	shut in
19-Dec-12	shut in	shut in	shut in
20-Dec-12	shut in	shut in	shut in
21-Dec-12	shut in	shut in	shut in
22-Dec-12	shut in	shut in	shut in
23-Dec-12	shut in	shut in	shut in
24-Dec-12	shut in	shut in	shut in
25-Dec-12	shut in	shut in	shut in
26-Dec-12	shut in	shut in	shut in
27-Dec-12	983	278	321
28-Dec-12	1017	264	295
29-Dec-12	1038	271	295
30-Dec-12	1050	278	286
31-Dec-12	1074	278	286



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Dec-12 Monthly Averages

Injection Pressure 1032

Injection Flow 274

Return Flow 297

Maximum Injection Pressure and corresponding Injection Flow

Date 31-Dec-12 Injection Pressure

Injection Flow

1074

278

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure

Injection Flow

27-Dec-12

983

278

Maximum Injection Flow Rate and corresponding Injection Pressure

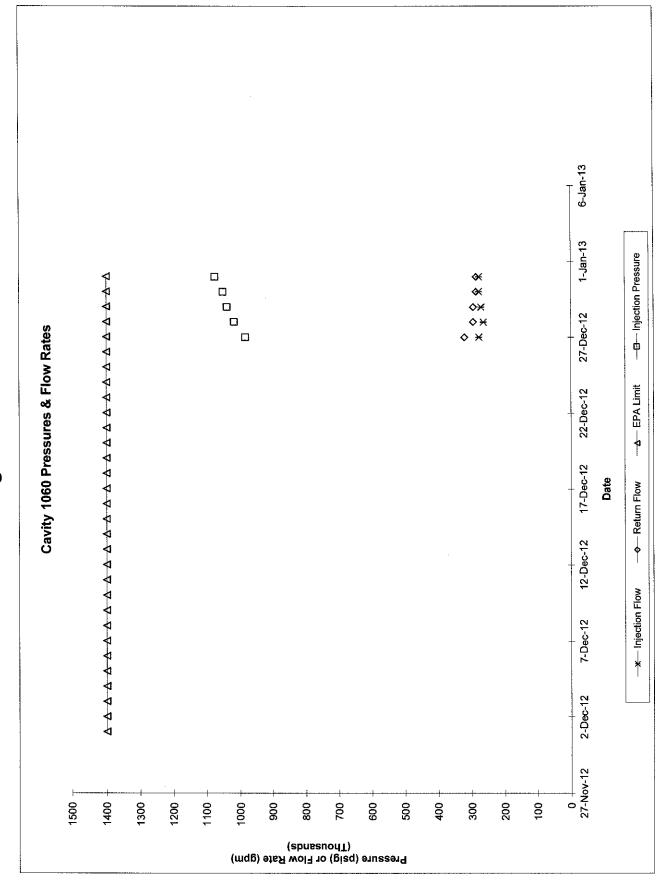
Date

27-Dec-12

Injection Flow 278

Injection Pressure 983

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Cavity 2030

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Dec-12	1177	277	277
2-Dec-12	120	152	152
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	1200	46	46
6-Dec-12	shut in	shut in	shut in
7-Dec-12	1177	297	297
8-Dec-12	1130	274	274
9-Dec-12	1130	257	257
10-Dec-12	1100	266	266
11-Dec-12	1200	263	263
12-Dec-12	1133	263	263
13-Dec-12	1187	240	240
14-Dec-12	1183	291	291
15-Dec-12	1170	278	278
16-Dec-12	1183	278	278
17-Dec-12	1153	274	274
18-Dec-12	1125	282	282
19-Dec-12	1200	262	262
20-Dec-12	1167	269	269
21-Dec-12	1200	256	256
22-Dec-12	1130	262	262
23-Dec-12	1133	250	250
24-Dec-12	1188	237	237
25-Dec-12	1175	73	73
26-Dec-12	1100	261	261
27-Dec-12	1125	270	270
28-Dec-12	1200	242	242
29-Dec-12	1180	259	259
30-Dec-12	1188	275	275
31-Dec-12	1133	267	267



JAN 2 2 2013

Dec-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1125

247

247

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

5-Dec-12

1200

46

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Dec-12

120

152

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

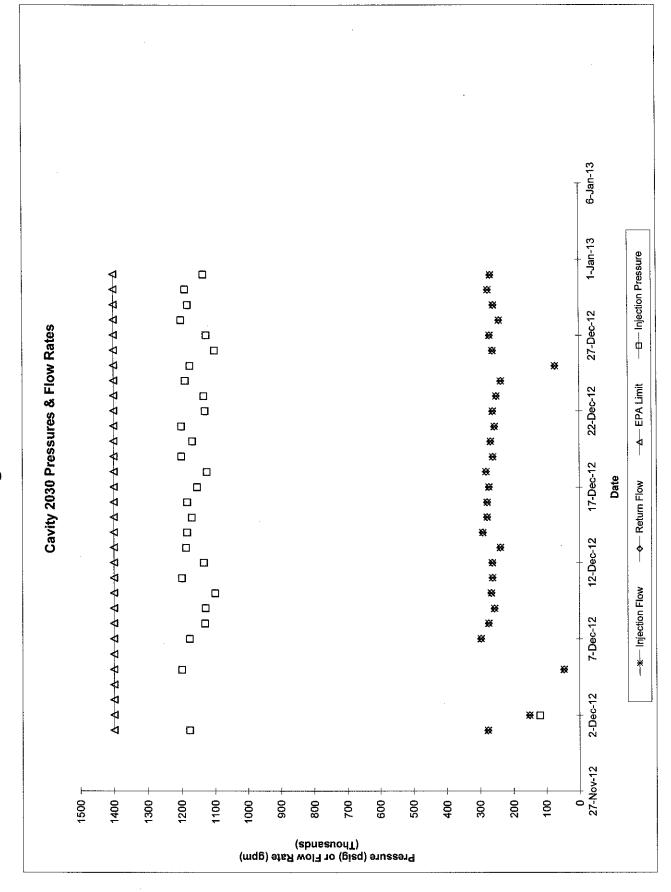
7-Dec-12

297

1177

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### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Dec-12	shut in	shut in	shut in
2-Dec-12	shut in	shut in	shut in
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	shut in	shut in	shut in
6-Dec-12	shut in	shut in	shut in
7-Dec-12	shut in	shut in	shut in
8-Dec-12	shut in	shut in	shut in
9-Dec-12	shut in	shut in	shut in
10-Dec-12	shut in	shut in	shut in
11-Dec-12	shut in	shut in	shut in
12-Dec-12	shut in	shut in	shut in
13-Dec-12	shut in	shut in	shut in
14-Dec-12	shut in	shut in	shut in
15-Dec-12	shut in	shut in	shut in
16-Dec-12	shut in	shut in	shut in
17-Dec-12	shut in	shut in	shut in
18-Dec-12	shut in	shut in	shut in
19-Dec-12	shut in	shut in	shut in
20-Dec-12	shut in	shut in	shut in
21-Dec-12	shut in	shut in	shut in
22-Dec-12	shut in	shut in	shut in
23-Dec-12	shut in	shut in	shut in
24-Dec-12	shut in	shut in	shut in
25-Dec-12	shut in	shut in	shut in
26-Dec-12	shut in	shut in	shut in
27-Dec-12	shut in	shut in	shut in
28-Dec-12	shut in	shut in	shut in
29-Dec-12	shut in	shut in	shut in
30-Dec-12	shut in	shut in	shut in
31-Dec-12	shut in	shut in	shut in



JAN 2 2 2013

Cavity 2061

### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow (gpm)
1.0 10	(psi)	(gpm)	(gpiii) 85
1-Dec-12	1177	85	71
2-Dec-12	1200	71	
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	1200	35	35
6-Dec-12	shut in	shut in	shut in
7-Dec-12	1177	96	96
8-Dec-12	1130	62	62
9-Dec-12	1130	57	57
10-Dec-12	1100	74	74
11-Dec-12	1200	83	83
12-Dec-12	1133	106	106
13-Dec-12	1187	109	109
14-Dec-12	1183	80	80
15-Dec-12	1170	90	90
16-Dec-12	1183	75	75
17-Dec-12	1153	81	81
18-Dec-12	1125	92	92
19-Dec-12	1200	101	101
20-Dec-12	1167	80	80
21-Dec-12	1200	94	94
22-Dec-12	1130	102	102
23-Dec-12	1133	121	121
24-Dec-12	1188	112	112
25-Dec-12	1175	123	123
26-Dec-12	1100	141	141
27-Dec-12	1125	156	156
28-Dec-12	1200	<b>√</b> 160	160
29-Dec-12	1180	128	128
30-Dec-12	1188	112	112
31-Dec-12	1133	110	110



JAN 2 2 2013

Dec-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1163

98

98

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Dec-12

1200

71

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

10-Dec-12

1100

74

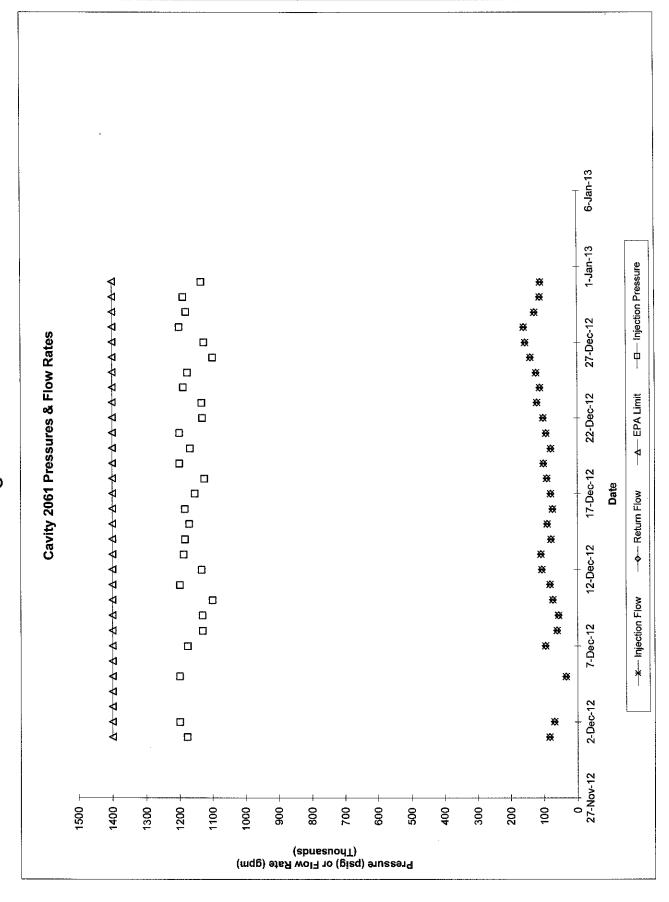
Maximum Injection Flow Rate and corresponding Injection Pressure

Date 28-Dec-12

Injection Flow (psi) 160 Injection Pressure (psi)

1200

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### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Dec-12	shut in	shut in	shut in
2-Dec-12	shut in	shut in	shut in
3-Dec-12	shut in	shut in	shut in
4-Dec-12	shut in	shut in	shut in
5-Dec-12	shut in	shut in	shut in
6-Dec-12	shut in	shut in	shut in
7-Dec-12	shut in	shut in	shut in
8-Dec-12	shut in	shut in	shut in
9-Dec-12	shut in	shut in	shut in
10-Dec-12	shut in	shut in	shut in
11-Dec-12	shut in	shut in	shut in
12-Dec-12	shut in	shut in	shut in
13-Dec-12	shut in	shut in	shut in
14-Dec-12	shut in	shut in	shut in
15-Dec-12	shut in	shut in	shut in
16-Dec-12	shut in	shut in	shut in
17-Dec-12	shut in	shut in	shut in
18-Dec-12	shut in	shut in	shut in
19-Dec-12	shut in	shut in	shut in
20-Dec-12	shut in	shut in	shut in
21-Dec-12	shut in	shut in	shut in
22-Dec-12	shut in	shut in	shut in
23-Dec-12	shut in	shut in	shut in
24-Dec-12	shut in	shut in	shut in
25-Dec-12	shut in	shut in	shut in
26-Dec-12	shut in	shut in	shut in
27-Dec-12	shut in	shut in	shut in
28-Dec-12	shut in	shut in	shut in
29-Dec-12	shut in	shut in	shut in
30-Dec-12	shut in	shut in	shut in
31-Dec-12	shut in	shut in	shut in



JAN 2 2 2013



January 14, 2013

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604



JAN 2 2 2013

UIC BRANCH EPA, REGION 5

Attn:

Lisa Perenchio

SUBJ: Fourth Quarter Report – Solution Mining Wells

For the period of October 1, 2012 - December 31, 2012

Permit No.: MI-133-3G-A002

- Solution Mining operations from Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061, Cavity 2062 were conducted during the quarter.
- 2. Well re-work reports for all well workovers during the period were submitted under separate cover by Doug Patulski, Minefield Superintendent.
- 3. The flowrates to and from the solution mining wells are monitored continuously. The required quarterly well injection/return balance demonstrations for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062 are attached.
- The fluid level in the injection zone is "at surface".
- Attached are copies of the well fluid chemical analyses for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062.
- Attached are the chemical analyses of the fluid samples obtained from the ground water monitoring wells.

The requirements of Part I (E)(10), Part II (B)(2) and Part III (C)(3) of Permit No. MI-133-3G-A002 are being met. The samples and measurements are representative of the monitoring activity and the analysis complies with the methods and procedures approved in the Waste Analysis Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please contact me at (231) 832-8800 if you have any questions.

Sincerely,

Doug Patulski

Production/Minefield Superintendent

Karl Tomaszewski Site Manager

**Attachments** 

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
***************************************			English and the second		
1-Oct-12	shut in	shut in	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in	shut in	shut in
30-Oct-12	shut in	shut in	shut in	shut in	shut in
31-Oct-12	shut in	shut in	shut in	shut in	shut in
1-Nov-12	shut in	shut in	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in	shut in	shut in

15-Nov-12	shut in				
16-Nov-12	shut in				
17-Nov-12	shut in				
18-Nov-12	shut in				
19-Nov-12	shut in				
20-Nov-12	shut in				
21-Nov-12	shut in				
22-Nov-12	shut in				
23-Nov-12	shut in				
24-Nov-12	shut in				
25-Nov-12	shut in				
26-Nov-12	shut in				
27-Nov-12	shut in				
28-Nov-12	shut in				
29-Nov-12	shut in				
30-Nov-12	shut in				
1-Dec-12	shut in				
2-Dec-12	shut in				
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	shut in				
6-Dec-12	shut in				
7-Dec-12	shut in				
8-Dec-12	shut in				
9-Dec-12	shut in				
10-Dec-12	shut in				
11-Dec-12	shut in				
12-Dec-12	shut in				
13-Dec-12	shut in				
14-Dec-12	shut in				
15-Dec-12	shut in				
16-Dec-12	shut in				
17-Dec-12	shut in				
18-Dec-12	shut in				
19-Dec-12	shut in				
20-Dec-12	shut in				
21-Dec-12	shut in				
22-Dec-12	shut in				
23-Dec-12	shut in				
24-Dec-12	shut in				
25-Dec-12	shut in				
26-Dec-12	shut in				
27-Dec-12	shut in				
28-Dec-12	shut in				
29-Dec-12	shut in				
30-Dec-12	shut in				
31-Dec-12	shut in				
	•	***			
Averages	shut in				

		Total				
	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
1-Oct-12	322	4.3	326	384	0.85	
2-Oct-12	252	3.2	255	339	0.75	
3-Oct-12	137	5.8	143	219	0.65	
4-Oct-12	75	3.1	78	107	0.73	
5-Oct-12	73	0.0	73	100	0.73	
6-Oct-12	76	0.0	76	104	0.73	
7-Oct-12	81	0.0	81	105	0.77	
8-Oct-12	92	5.0	97	111	0.87	
9-Oct-12	107	4.2	111	115	0.97	
10-Oct-12	88	3.9	92	122	0.75	
11-Oct-12	86	4.5	91	111	0.82	
12-Oct-12	87	3.7	91	163	0.56	
13-Oct-12	89	3.3	92	69	1.34	
14-Oct-12	92	3.5	96	127	0.75	
15-Oct-12	92	4.0	96	122	0.79	
16-Oct-12	89	4.0	93	120	0.78	
17-Oct-12	100	3.7	104	133	0.78	
18-Oct-12	102	3.5	106	122	0.86	
19-Oct-12	100	4.0	104	116	0.90	
20-Oct-12	114	0.0	114	122	0.93	
21-Oct-12	100	4.0	104	132	0.79	
22-Oct-12	97	0.0	97	124	0.78	
23-Oct-12	95	3.0	98	120	0.82	
24-Oct-12	99	2.5	102	129	0.79	
25-Oct-12	92	2.7	95	95	1.00	
26-Oct-12	93	3.4	96	108	0.89	
27-Oct-12	99	4.1	103	127	0.81	
28-Oct-12	115	4.3	119	124	0.96	
29-Oct-12	110	4.9	115	168	0.68	
30-Oct-12	133	3,3	136	164	0.83	
31-Oct-12	144	2.4	146	187	0.78	
1-Nov-12	149	2.4	151	170	0.89	
2-Nov-12	156	3.2	159	176	0.90	
3-Nov-12	164	4.0	168	194	0.87	
4-Nov-12	149	0.0	149	181	0.82	
5-Nov-12	159	1.5	161	188	0.85	
6-Nov-12	160	4.2	164	174	0.94	
7-Nov-12	162	4.4	166	181	0.92	
8-Nov-12	164	4.2	168	181	0.93	
9-Nov-12	154	3.7	158	181	0.87	
10-Nov-12	167	2.8	170	175	0.97	
11-Nov-12	151	1.1	152	158	0.96	
12-Nov-12	143	4.2	147	172	0.86	
13-Nov-12	137	2.6	140	187	0.75	
14-Nov-12	147	3.5	151	184	0.82	

15-Nov-12	152	3.6	156	187	0.83
16-Nov-12	156	3.8	160	193	0.83
17-Nov-12	162	4.2	166	195	0.85
18-Nov-12	150	3.9	154	190	0.81
19-Nov-12	182	3.9	186	192	0.97
20-Nov-12	170	4.1	174	220	0.79
21-Nov-12	157	4.9	162	218	0.74
22-Nov-12	184	4.9	189	229	0.82
23-Nov-12	207	4.7	212	251	0.84
24-Nov-12	203	2.7	206	237	0.87
25-Nov-12	205	3.2	208	236	0.88
26-Nov-12	205	3.6	209	235	0.89
27-Nov-12	211	4.4	215	239	0.90
28-Nov-12	173	2.9	176	234	0.75
29-Nov-12	208	3.8	212	259	0.82
30-Nov-12	307	2.6	310	312	0.99
1-Dec-12	283	3.3	286	363	0.79
2-Dec-12	159	2.4	161	201	0.80
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	48	3.2	51	81	0.63
6-Dec-12	shut in				
7-Dec-12	299	5.2	304	287	1.06
8-Dec-12	295	1.9	297	319	0.93
9-Dec-12	285	2.6	288	311	0.92
10-Dec-12	324	3.5	328	358	0.91
11-Dec-12	339	1.6	341	349	0.98
12-Dec-12	343	4.0	347	372	0.93
13-Dec-12	348	4.9	353	375	0.94
14-Dec-12	353	3.2	356	375	0.95
15-Dec-12	347	4.1	351	368	0.95
16-Dec-12	344	3.3	347	361	0.96
17-Dec-12	353	0.0	353	383	0.92
18-Dec-12	371	0.0	371	391	0.95
19-Dec-12	341	1.5	343	356	0.96
20-Dec-12	331	5.6	337	343	0.98
21-Dec-12	326	6.3	332	349	0.95
22-Dec-12	326	6.8	333	371	0.90
23-Dec-12	359	4.9	364	378	0.96
24-Dec-12	342	2.0	344	358	0.96
25-Dec-12	334	5.5	340	371	0.92
26-Dec-12	233	6.8	240	300	0.80
27-Dec-12	108	6.8	115	112	1.03
28-Dec-12	118	6.2	124	90	1.38
29-Dec-12	85	4.1	89	127	0.70
30-Dec-12	99	5.2	104	110	0.95
31-Dec-12	103	5.0	108	119	0.91
Averages	182	3.5	188	211	0.87

Total					
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Oct-12	shut in	shut in	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in	shut in	shut in
30-Oct-12	shut in	shut in	shut in	shut in	shut in
31-Oct-12	shut in	shut in	shut in	shut in	shut in
1-Nov-12	shut in	shut in	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in	shut in	shut in

15-Nov-12	shut in				
16-Nov-12	shut in				
17-Nov-12	shut in				
18-Nov-12	shut in				
19-Nov-12	shut in				
20-Nov-12	shut in				
21-Nov-12	shut in				
22-Nov-12	shut in				
23-Nov-12	shut in				
24-Nov-12	shut in				
25-Nov-12	shut in				
26-Nov-12	shut in				
27-Nov-12	shut in				
28-Nov-12	shut in				
29-Nov-12	shut in				
30-Nov-12	shut in				
1-Dec-12	shut in				
2-Dec-12	shut in				
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	shut in				
6-Dec-12	shut in				
7-Dec-12	shut in				
8-Dec-12	shut in				
9-Dec-12	shut in				
10-Dec-12	shut in				
11-Dec-12	shut in				
12-Dec-12	shut in				
13-Dec-12	shut in				
14-Dec-12	shut in				
15-Dec-12	shut in				
16-Dec-12	shut in				
17-Dec-12	shut in				
18-Dec-12	shut in				
19-Dec-12	shut in				
20-Dec-12	shut in				
21-Dec-12	shut in				
22-Dec-12	shut in				
23-Dec-12	shut in				
24-Dec-12	shut in				
25-Dec-12	shut in				
26-Dec-12	shut in				
27-Dec-12	shut in				
28-Dec-12	shut in				
29-Dec-12	shut in				
30-Dec-12	shut in				
31-Dec-12	shut in				
Averages	shut in				

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Oct-12	166	2.9	169	166	1.02
2-Oct-12	169	2.5	172	169	1.01
3-Oct-12	166	5.1	171	166	1.03
4-Oct-12	173	3.4	176	173	1.02
5-Oct-12	163	0.0	163	163	1.00
6-Oct-12	173	0.0	173	173	1.00
7-Oct-12	157	0.0	157	157	1.00
8-Oct-12	163	3.0	166	163	1.02
9-Oct-12	165	4.7	170	165	1.03
10-Oct-12	156	3.8	160	156	1.02
11-Oct-12	169	4.6	174	169	1.03
12-Oct-12	182	4.4	186	182	1.02
13-Oct-12	180	3.8	184	180	1.02
14-Oct-12	175	4.4	179	175	1.03
15-Oct-12	161	4.1	165	161	1.03
16-Oct-12	154	4.4	158	154	1.03
17-Oct-12	170	1.9	172	170	1.01
18-Oct-12	177	5.7	183	177	1.03
19-Oct-12	157	4.0	161	157	1.03
20-Oct-12	175	0.0	175	175	1.00
21-Oct-12	172	4.0	176	172	1.02
22-Oct-12	158	0.0	158	158	1.00
23-Oct-12	154	6.5	161	154	1.04
24-Oct-12	139	3.9	143	139	1.03
25-Oct-12	134	2.8	137	134	1.02
26-Oct-12	176	4.2	180	176	1.02
27-Oct-12	173	4.5	178	173	1.03
28-Oct-12	170	5.0	175	170	1.03
29-Oct-12	134	4.2	138	134	1.03
30-Oct-12	97	2.8	100	97	1.03
31-Oct-12	144	4.2	148	144	1.03
1-Nov-12	147	3.6	151	147	1.02
2-Nov-12	119	3.1	122	119	1.03
3-Nov-12	140	5.0	145	140	1.04
4-Nov-12	133	5.3	138	133	1.04
5-Nov-12	139	5.0	144	139	1.04
6-Nov-12	144	4.4	148	144	1.03
7-Nov-12	133	4.7	138	133	1.04
8-Nov-12	127	4.8	132	127	1.04
9-Nov-12	161	4.2	165	161	1.03
10-Nov-12	146	2.9	149	146	1.02
11-Nov-12	146	3.8	150	146	1.03
12-Nov-12	144	4.5	149	144	1.03
13-Nov-12	127	4.2	131	127	1.03
14-Nov-12	130	3.8	134	130	1.03
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15-Nov-12	140	3.9	144	140	1.03
16-Nov-12	135	3.2	138	135	1.02
17-Nov-12	146	2.9	149	146	1.02
18-Nov-12	120	2.6	123	120	1.02
19-Nov-12	152	3.9	156	152	1.03
20-Nov-12	165	4.6	170	165	1.03
21-Nov-12	137	3.7	141	137	1.03
22-Nov-12	132	2.8	135	132	1.02
23-Nov-12	124	3.4	127	124	1.03
24-Nov-12	134	2.6	137	134	1.02
25-Nov-12	157	1.9	159	157	1.01
26-Nov-12	142	1.7	144	142	1.01
27-Nov-12	110	1.2	111	110	1,01
28-Nov-12	147	2.5	150	147	1.02
29-Nov-12	135	3.6	139	135	1.03
30-Nov-12	113	4.4	117	113	1.04
1-Dec-12	135	3.9	139	135	1.03
2-Dec-12	95	3.7	99	95	1.04
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	125	3.8	129	125	1.03
6-Dec-12	shut in				
7-Dec-12	173	5,3	178	173	1.03
8-Dec-12	165	3.5	169	165	1.02
9-Dec-12	173	2.7	176	173	1.02
10-Dec-12	182	2.4	184	182	1.01
11-Dec-12	172	1.1	173	172	1.01
12-Dec-12	161	4.2	165	161	1.03
13-Dec-12	159	2.9	162	159	1.02
14-Dec-12	180	3.5	184	180	1.02
15-Dec-12	181	0.0	181	181	1.00
16-Dec-12	172	3.4	175	172	1.02
17-Dec-12	184	1.6	186	184	1.01
18-Dec-12	170	2.1	172	170	1.01
19-Dec-12	148	1.5	150	148	1.01
20-Dec-12	180	3.2	183	180	1.02
21-Dec-12	172	4.1	176	172	1.02
22-Dec-12	173	2.7	176	173	1.02
23-Dec-12	154	4.6	159	154	1.03
24-Dec-12	168	5.4	173	168	1.03
25-Dec-12	167	1.9	169	167	1.01
26-Dec-12	188	2.7	191	188	1.01
27-Dec-12	120	2.3	122	120	1.02
28-Dec-12	133	3.8	137	133	1.03
29-Dec-12	121	2.7	124	121	1.02
30-Dec-12	125	1.3	126	125	1.01
31-Dec-12	129	1.5	131	129	1.01
Averages	152	3	156	153	1

			Total			
	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
		<u> </u>				
1-Oct-12	shut in	shut in	shut in	shut in	shut in	
2-Oct-12	shut in	shut in	shut in	shut in	shut in	
3-Oct-12	300	5.0	305	237	1.29	
4-Oct-12	340	4.2	344	288	1.20	
5-Oct-12	313	0.0	313	301	1.04	
6-Oct-12	354	0.0	354	321	1.10	
7-Oct-12	333	0.0	333	320	1.04	
8-Oct-12	319	5.3	324	295	1.10	
9-Oct-12	292	2.8	295	273	1.08	
10-Oct-12	285	6.4	291	296	0.98	
11-Oct-12	299	5.9	305	279	1.09	
12-Oct-12	285	2.9	288	286	1.01	
13-Oct-12	278	3.0	281	288	0.98	
14-Oct-12	271	4.7	276	279	0.99	
15-Oct-12	299	5.1	304	284	1.07	
16-Oct-12	264	5.3	269	274	0.98	
17-Oct-12	271	1.5	273	280	0.97	
18-Oct-12	271	5.3	276	306	0.90	
19-Oct-12	278	5.0	283	238	1.19	
20-Oct-12	271	0.0	271	272	1.00	
21-Oct-12	278	5.0	283	294	0.96	
22-Oct-12	271	0.0	271	275	0.99	
23-Oct-12	278	6.2	284	272	1.04	
24-Oct-12	278	5.2	283	270	1.05	
25-Oct-12	236	5.3	241	246	0.98	
26-Oct-12	278	5.5	284	271	1.05	
27-Oct-12	271	5.2	276	269	1.03	
28-Oct-12	264	5.3	269	275	0.98	
29-Oct-12	257	5.1	262	256	1.02	
30-Oct-12	236	4.3	240	230	1.04	
31-Oct-12	243	4.0	247	269	0.92	
1-Nov-12	222	3.4	225	241	0.94	
2-Nov-12	222	5.1	227	245	0.93	
3-Nov-12	264	4.8	269	270	1.00	
4-Nov-12	257	5.5	263	257	1.02	
5-Nov-12	257	5.9	263	271	0.97	
6-Nov-12	257	5.7	263	261	1.01	
7-Nov-12	250	5.7	256	254	1.01	
8-Nov-12	257	5.8	263	258	1.02	
9-Nov-12	250	5.0	255	278	0.92	
10-Nov-12	257	4.0	261	269	0.97	
11-Nov-12	271	4.0	275	276	1.00	
12-Nov-12	264	0.0	264	278	0.95	
13-Nov-12	257	4.3	261	277	0.94	
14-Nov-12	250	4.6	255	275	0.93	
1 - 1404 12	200	7.∪	200	210	0.00	

15-Nov-12	243	5.0	248	273	0.91
16-Nov-12	250	5.4	255	279	0.92
17-Nov-12	250	5.3	255	275	0.93
18-Nov-12	236	5.4	241	255	0.95
19-Nov-12	194	5.9	200	234	0.85
20-Nov-12	215	4.4	219	237	0.93
21-Nov-12	222	3.6	226	232	0.97
22-Nov-12	215	3.1	218	233	0.94
23-Nov-12	201	4.0	205	225	0.91
24-Nov-12	194	3.1	197	214	0.92
25-Nov-12	201	2.8	204	212	0.96
26-Nov-12	194	2.4	196	208	0.94
27-Nov-12	194	2.2	196	209	0.94
28-Nov-12	167	4.2	171	197	0.87
29-Nov-12	188	6.0	194	196	0.99
30-Nov-12	0	7.5	8	132	0.06
1-Dec-12	shut in				
2-Dec-12	shut in				
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	shut in				
6-Dec-12	shut in				
7-Dec-12	shut in				
8-Dec-12	shut in				
9-Dec-12	shut in				
10-Dec-12	shut in				
11-Dec-12	shut in				
12-Dec-12	shut in				
13-Dec-12	shut in				
14-Dec-12	shut in				
15-Dec-12	shut in				
16-Dec-12	shut in				
17-Dec-12	shut in				
18-Dec-12	shut in				
19-Dec-12	shut in				
20-Dec-12	shut in				
21-Dec-12	shut in				
22-Dec-12	shut in				
23-Dec-12	shut in				
24-Dec-12	shut in				
25-Dec-12	shut in				
26-Dec-12	shut in				
27-Dec-12	278	5.7	284	321	0.88
28-Dec-12	264	0.0	264	295	0.89
29-Dec-12	271	0.0	271	295	0.92
30-Dec-12	278	4.4	282	286	0.99
31-Dec-12	278	4.4	282	286	0.99
Averages	254	4	258	263	1
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			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Oct-12	279	0.0	279	279	1.00
2-Oct-12	277	0.0	277	277	1.00
3-Oct-12	274	0.0	274	274	1.00
4-Oct-12	275	0.0	275	275	1.00
5-Oct-12	286	0.0	286	286	1.00
6-Oct-12	283	0.0	283	283	1.00
7-Oct-12	298	0.0	298	298	1.00
8-Oct-12	261	0.0	261	261	1.00
9-Oct-12	275	0.0	275	275	1.00
10-Oct-12	266	0.0	266	266	1.00
11-Oct-12	287	0.0	287	287	1.00
12-Oct-12	288	0.0	288	288	1.00
13-Oct-12	271	0.0	271	271	1.00
14-Oct-12	270	0.0	270	270	1.00
15-Oct-12	287	0.0	287	287	1.00
16-Oct-12	288	0.0	288	288	1.00
17-Oct-12	285	0.0	285	285	1.00
18-Oct-12	283	0.0	283	283	1.00
19-Oct-12	284	0.0	284	284	1.00
20-Oct-12	270	0.0	270	270	1.00
21-Oct-12	290	0.0	290	290	1.00
22-Oct-12	283	0.0	283	283	1.00
23-Oct-12	272	0.0	272	272	1.00
24-Oct-12	275	0.0	275	275	1.00
25-Oct-12	232	0.0	232	232	1.00
26-Oct-12	250	0.0	250	250	1.00
27-Oct-12	276	0.0	276	276	1.00
28-Oct-12	277	0.0	277	277	1.00
29-Oct-12	285	0.0	285	285	1.00
30-Oct-12	282	0.0	282	282	1.00
31-Oct-12	278	0.0	278	278	1.00
1-Nov-12	277	0.0	277	277	1.00
2-Nov-12	265	0.0	265	265	1.00
3-Nov-12	317	0.0	317	317	1.00
4-Nov-12	307	0.0	307	307	1.00
5-Nov-12	293	0.0	293	293	1.00
6-Nov-12	289	0.0	289	289	
7-Nov-12	306				1.00
8-Nov-12	299	0.0	306	306	1.00
		0.0	299	299	1.00
9-Nov-12	278	0.0	278	278	1.00
10-Nov-12 11-Nov-12	290	0.0	290	290	1.00
	310	0.0	310	310	1.00
12-Nov-12	298	0.0	298	298	1.00
13-Nov-12	301	0.0	301	301	1.00
14-Nov-12	291	0.0	291	291	1.00

15-Nov-12	300	0.0	300	300	1.00
16-Nov-12	314	0.0	314	314	1.00
17-Nov-12	292	0.0	292	292	1.00
18-Nov-12	294	0.0	294	294	1.00
19-Nov-12	290	0.0	290	290	1.00
20-Nov-12	294	0.0	294	294	1.00
21-Nov-12	284	0.0	284	284	1.00
22-Nov-12	296	0.0	296	296	1.00
23-Nov-12	296	0.0	296	296	1.00
24-Nov-12	289	0.0	289	289	1.00
25-Nov-12	302	0.0	302	302	1.00
26-Nov-12	299	0.0	299	299	1.00
27-Nov-12	292	0.0	292	292	1.00
28-Nov-12	288	0.0	288	288	1.00
29-Nov-12	275	0.0	275	275	1.00
30-Nov-12	271	0.0	271	271	1.00
1-Dec-12	277	0.0	277	277	1.00
2-Dec-12	152	0.0	152	152	1.00
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	46	0.0	46	46	1.00
6-Dec-12	165	0.0	165	165	1.00
7-Dec-12	297	0.0	297	297	1.00
8-Dec-12	274	0.0	274	274	1.00
9-Dec-12	257	0.0	257	257	1.00
10-Dec-12	266	0.0	266	266	1.00
11-Dec-12	263	0.0	263	263	1.00
12-Dec-12	263	0.0	263	263	1.00
13-Dec-12	240	0.0	240	240	1.00
14-Dec-12	291	0.0	291	291	1.00
15-Dec-12	278	0.0	278	278	1.00
16-Dec-12	278	0.0	278	278	1.00
17-Dec-12	274	0.0	274	274	1.00
18-Dec-12	282	0.0	282	282	1.00
19-Dec-12	262	0.0	262	262	1.00
20-Dec-12	269	0.0	269	269	1.00
21-Dec-12	256	0.0	256	256	1.00
22-Dec-12	262	0.0	262	262	1.00
23-Dec-12	250	0.0	250	250	1.00
24-Dec-12	237	0.0	237	237	1.00
25-Dec-12	73	0.0	73	73	1.00
26-Dec-12	261	0.0	261	261	1.00
27-Dec-12	270	0.0	270	270	1.00
28-Dec-12	242	0.0	242	242	1.00
29-Dec-12	259	0.0	259	259	1.00
30-Dec-12	275	0.0	275	275	1.00
31-Dec-12	267	0.0	267	267	1.00
Averages	272	0.0	272	272	1.00
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			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
4 0 . 40					
1-Oct-12	shut in	shut in	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in	shut in	shut in
13-Oct-12	shut in	shut in	. shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in	shut in	shut in
30-Oct-12	shut in	shut in	shut in	shut in	shut in
31-Oct-12	shut in	shut in	shut in	shut in	shut in
1-Nov-12	shut in	shut in	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in	shut in	shut in
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12-Nov-12	shut in	shut in	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in	shut in	shut in
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29-Dec-12	shut in				
30-Dec-12	shut in				
31-Dec-12	shut in				
Averages	shut in				

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Oct-12	112	0.0	112	112	1.00
2-Oct-12	113	0.0	113	113	1.00
3-Oct-12	89	0.0	89	89	1.00
4-Oct-12	145	0.0	145	145	1.00
5-Oct-12	135	0.0	135	135	1.00
6-Oct-12	140	0.0	140	140	1.00
7-Oct-12	123	0.0	123	123	1.00
8-Oct-12	141	0.0	141	141	1.00
9-Oct-12	124	0.0	124	124	1.00
10-Oct-12	142	0.0	142	142	1.00
11-Oct-12	117	0.0	117	117	1.00
12-Oct-12	111	0.0	111	111	1.00
13-Oct-12	110	0.0	110	110	1.00
14-Oct-12	108	0.0	108	108	1.00
15-Oct-12	105	0.0	105	105	1.00
16-Oct-12	115	0.0	115	115	1.00
17-Oct-12	105	0.0	105	105	1.00
18-Oct-12	113	0.0	113	113	1.00
19-Oct-12	129	0.0	129	129	1.00
20-Oct-12	120	0.0	120	120	1.00
21-Oct-12	116	0.0	116	116	1.00
22-Oct-12	113	0.0	113	113	1.00
23-Oct-12	108	0.0	108	108	1.00
24-Oct-12	96	0.0	96	96	1.00
25-Oct-12	84	0.0	84	84	1.00
26-Oct-12	112	0.0	112	112	1.00
27-Oct-12	113	0.0	113	113	1.00
28-Oct-12	92	0.0	92	92	1.00
29-Oct-12	103	0.0	103	103	1.00
30-Oct-12	115	0.0	115	115	1.00
31-Oct-12	108	0.0	108	108	1.00
1-Nov-12	121	0.0	121	121	1.00
2-Nov-12	118	0.0	118	118	1.00
3-Nov-12	132	0.0	132	132	1.00
4-Nov-12	130	0.0	130	130	1.00
5-Nov-12	155	0.0	155	155	1.00
6-Nov-12	149	0.0	149	149	1.00
7-Nov-12	126	0.0	126	126	1.00
8-Nov-12	132	0.0	132	132	1.00
9-Nov-12	132	0.0	132	132	1.00
10-Nov-12	116	0.0	116	116	1.00
11-Nov-12	121	0.0	121	121	1.00
12-Nov-12	121	0.0			
12-Nov-12 13-Nov-12			121	121 121	1.00
13-Nov-12 14-Nov-12	131 134	0.0	131	131 134	1.00
14-MOV-12	13 <del>4</del>	0.0	134	134	1.00

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15-Nov-12	120	0.0	120	120	1.00
16-Nov-12	124	0.0	124	124	1.00
17-Nov-12	139	0.0	139	139	1.00
18-Nov-12	131	0.0	131	131	1.00
19-Nov-12	119	0.0	119	119	1.00
20-Nov-12	122	0.0	122	122	1.00
21-Nov-12	120	0.0	120	120	1.00
22-Nov-12	132	0.0	132	132	1.00
23-Nov-12	138	0.0	138	138	1.00
24-Nov-12	128	0.0	128	128	1.00
25-Nov-12	111	0.0	111	111	1.00
26-Nov-12	119	0.0	119	119	1.00
27-Nov-12	120	0.0	120	120	1.00
28-Nov-12	99	0.0	99	99	1.00
29-Nov-12	132	0.0	132	132	1.00
30-Nov-12	91	0.0	91	91	1.00
1-Dec-12	85	0.0	85	85	1.00
2-Dec-12	71	0.0	71	71	1.00
3-Dec-12	shut in				
4-Dec-12	shut in				
5-Dec-12	35	0.0	35	35	1.00
6-Dec-12	108	0.0	108	108	1.00
7-Dec-12	96	0.0	96	96	1.00
8-Dec-12	62	0.0	62	62	1.00
9-Dec-12	57	0.0	57	57	1.00
10-Dec-12	74	0.0	74	74	1.00
11-Dec-12	83	0.0	83	83	1.00
12-Dec-12	106	0.0	106	106	1.00
13-Dec-12	109	0.0	109	109	1.00
14-Dec-12	80	0.0	80	80	1.00
15-Dec-12	90	0.0	90	90	1.00
16-Dec-12	75	0.0	75	75	1.00
17-Dec-12	81	0.0	81	81	1.00
18-Dec-12	92	0.0	92	92	1.00
19-Dec-12	101	0.0	101	101	1.00
20-Dec-12	80	0.0	80	80	1.00
21-Dec-12	94	0.0	94	94	1.00
22-Dec-12	102	0.0	102	102	1.00
23-Dec-12	121	0.0	121	121	1.00
24-Dec-12	112	0.0	112	112	1.00
25-Dec-12	123	0.0	123	123	1.00
26-Dec-12	141	0.0	141	141	1.00
27-Dec-12	156	0.0	156	156	1.00
28-Dec-12	160	0.0	160	160	1.00
29-Dec-12	128	0.0	128	128	1.00
30-Dec-12	112	0.0	112	112	1.00
31-Dec-12	110	0.0	110	110	1.00
<b>A</b>	4.45	•	4.5	4.4	
Averages	113	0.0	113	113	1.00

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
					- Nation
1-Oct-12	shut in	shut in	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in	shut in	shut in
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5-Oct-12	shut in	shut in	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in	shut in	shut in
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31-Oct-12	shut in	shut in	shut in	shut in	shut in
1-Nov-12	shut in	shut in	shut in	shut in	shut in
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5-Nov-12	shut in	shut in	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in	shut in	shut in
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15-Nov-12	shut in				
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28-Dec-12	shut in				
29-Dec-12	shut in				
30-Dec-12	shut in				
31-Dec-12	shut in				
Averages	shut in				



Mosaic Potash Hersey LLC 1395 135<sup>th</sup> Avenue Hersey, MI 49639 www.mosaicco.com

# 2012 Monitor Well Results – 4<sup>th</sup> Quarter Cluster 1

Date	Well Number	Chloride Concentration (mg/L)
December 2012	Cluster 1 M.W. 01	460.9
December 2012	Cluster 1 M.W. 02	678.9
December 2012	Cluster 1 M.W. 03	40.8
December 2012	Cluster 1 M.W. 04	2162.6
December 2012	Cluster 1 M.W. 05	638.2
December 2012	Cluster 1 M.W. 06	177.3
December 2012	Cluster 1 M.W. 07	455.6
December 2012	Cluster 1 M.W. 08	517.6
December 2012	Cluster 1 M.W. 09	7675.6
December 2012	Cluster 1 M.W. 10	4573.4
December 2012	Cluster 1 M.W. 11	569
December 2012	Cluster 1 M.W. 12	301.4
December 2012	Cluster 1 M.W. 13	3190.8
December 2012	Cluster 1 M.W. 14	234
December 2012	Cluster 1 M.W. 34	2995.8
December 2012	Cluster 1 M.W. 35	136.5
December 2012	Cluster 1 M.W. 36	31.9
December 2012	Cluster 1 M.W. 37	1772.7
December 2012	Cluster 1 M.W. 38	33.7
December 2012	Cluster 1 M.W. 39	16
December 2012	Cluster 1 M.W. 40	241.1

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# 2012 Monitor Well Results – 4<sup>th</sup> Quarter Cluster 2

Date	Well Number	Chloride Concentration (mg/L)
December 2012	Cluster 2 M.W. 01	115.2
December 2012	Cluster 2 M.W. 02	Dry well
December 2012	Cluster 2 M.W. 04	65.6
December 2012	Cluster 2 M.W. 05	152.4
December 2012	Cluster 2 M.W. 06	24.8
December 2012	Cluster 2 M.W. 10	Dry well
December 2012	Cluster 2 M.W. 33	55.0

#### MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

DATE SAMPLED	TIME SAMPLED	SAMPLE #	SAMPLER	NAME/SIGNATURE	
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12-11-12	10,00 A.M	/1(PP-1)	antin	J. Pelilo	ない 大学 かいかい かいかい かんしゅう かんしゅう かんしゅう かんしゅう かんしゅう かんしゅう かんかい かんしゅう かんしゅん かんしゅん かんしゅん かんしゅん かんしゅん かんしゅん かんしゅん かんしゃ かんしゃ かんしゃ かんしゃ かんしゃ かんしゃ かんしゃ かんし
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12-11-12	and Contract To Fall		and the same of th	Market Strate and a selection of the sel	Andread Street, Section of Stree
12-11-12	11:05 A.D	reid at a matter could be a fait a farmen and faite and a	(do-th)		he allowed special and the second special second se
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12-11-12	12:00 P.M.	9 (CL2-4)	astino	Pett	The state of the s
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#### MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

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# MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

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Received in Lab By (Name/Signature)
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Date Received

12/12/12

Time Received

#### MOSAIC POTASH MERSEY MONITORING WELLS CHAIN OF CUSTODY

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\* Note: Needs Repair



December 27, 2012

Mosaic Potash - Hersey Attn: Ms. Allison VanOs 1395 - 135th Avenue Hersey, MI 49639

#### **Project: Quarterly Monitoring of Inorganic Pollutants**

Dear Ms. Allison VanOs,

Enclosed is a copy of the laboratory report for the following work order(s) received by TriMatrix Laboratories:

Work Order

Received

Description

1212202

12/12/2012

**Laboratory Services** 

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and/or one of the following certification programs:

ACLASS DoD-ELAP/ISO17025 (#ADE-1542); Arkansas DEP (#12-056-0); Florida DEP (#E87622-24); Georgia EPD (#E87622-24); Illinois DEP (#002841); Kansas DPH (#E-10302); Kentucky DEP (#0021); Louisiana DEP (#03068); Michigan DPH (#0034); Minnesota DPH (#367345); New York ELAP (#46503); North Carolina DNRE (#659); Texas CEQ (#T104704495-12-2); Virginia DCLS (#1622); Wisconsin DNR (#999472650); USDA Soil Import Permit (#P330-09-00163).

Any qualification or narration of results, including sample acceptance requirements and test exceptions to the above referenced programs, is presented in the Statement of Data Qualifications section of this report. Estimates of analytical uncertainties and certification documents for the test results contained within this report are available upon request.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Jennifer L. Rice Project Chemist



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Disposal

Lab Sample ID: Matrix:

1212202-01

Water

Work Order:

1212202

A.V.

Description:

Laboratory Services

Sampled:

12/11/12 08:55

Sampled By: Received:

12/12/12 10:00

#### Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Barium	94	<b></b>			USEPA-6010C			1215465
Darsum	94	50	ug/L	5	03F54-0010C	12/19/12 12:40	KLV	1215465
Calcium	460	50	mg/L	100	USEPA-6010C	12/19/12 11:22	KLV	1215465
*Cobalt	<50	50	ug/L	5	USEPA-6010C	12/19/12 12:40	KŁV	1215465
*Copper	<50	50	ug/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465
Iron	3200	250	ug/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465
*Lead	<250	250	ug/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465
Magnesium	77	2.5	mg/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465
Мапдапеѕе	160	50	ug/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465
*Selenium	<5.0	5.0	ug/L	5	USEPA-6020A	12/24/12 11:09	CKD	1215467
Sodium	23000	50	mg/L	100	USEPA-6010C	12/19/12 11:22	KLV	1215465
*Zinc	<100	100	ug/L	5	USEPA-6010C	12/19/12 12:40	KLV	1215465



JAN 2 2 2013

UIC BRANCH EA. RECIONS

\*See Statement of Data Qualifications

Page 2 of 10



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Disposal

Lab Sample ID: Matrix: 1212202-01

Water

Work Order:

1212202

Description:

Laboratory Services

Sampled:

12/11/12 08:55

Sampled By:

By: A.V.

Received:

12/12/12 10:00

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	95	20	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215419
Alkalinity, Carbonate	<2.0	2.0	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215420
Alkalinity, Total	95	20	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215421
Bromide	310	300	mg/L	100	ASTM D 1246-95 (99)	12/26/12 11:30	KAR	1215789
Chloride	45000	500	mg/L	500	SM 4500-CI E 20th	12/21/12 09:59	LMA	1215651
Conductivity @ 25° C	111300	5	umhos/cm	1	SM 2510 B 20th	12/13/12 10:43	HLB	1215309
*рН	7.0	1.0	pH Units	1	SM 4500-H B 20th	12/13/12 12:50	SKA	1215321
*Oxidation/Reduction Potential	142	1	mV	1	ASTM D 1498-76	12/14/12 09:10	LMA	1215370
Sulfate	770	120	mg/L	25	ASTM D516-90 (02)	12/13/12 12:11	LMA	1215349
Residue, Dissolved @ 180° C	87200	2500	mg/L	1	SM 2540 C 20th	12/13/12 16:00	WAH	1215341
Specific Gravity	1.0686	0.7000	@ 60 °F	1	ASTM D 1429-79	12/13/12 14:10	HLB	1215331
Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	12/24/12 15:32	KAR	1215794
Sulfide, Total	16	1.0	mg/L	1	SM 4500-S2 F 20th	12/18/12 15:00	KAR	1215743



JAN 2 2 2013

UIC BRANCH EPA, REGION 5

\*See Statement of Data Qualifications

Page 3 of 10



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle Lab Sample ID:

Matrix:

1212202-02 Water

Work Order:

1212202

A.V.

Description:

Laboratory Services

Sampled:

12/11/12 08:45

Sampled By: Received:

12/12/12 10:00

#### Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Barium	280	100	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
Calcium	1400	250	mg/L	500	USEPA-6010C	12/19/12 11:26	KLV	1215465
*Cobalt	<100	100	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
*Copper	<100	100	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
Iron	1200	500	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
*Lead	<500	500	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
Magnesium	110	5.0	mg/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465
Manganese	210	100	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	<b>1</b> 215465
*Selenium	<200	200	ug/L	200	USEPA-6020A	12/24/12 11:24	CKD	1215467
Sodium	95000	250	mg/L	500	USEPA-6010C	12/19/12 11:26	KLV	1215465
*Zinc	<200	200	ug/L	10	USEPA-6010C	12/19/12 12:44	KLV	1215465



JAN 2 2 2013

UCBRANCH EPA, REGIONS

\*See Statement of Data Qualifications

Page 4 of 10



Client:

Mosaic Potash - Hersey

Work Order:

1212202

Project:

Quarterly Monitoring of Inorganic Pollutants

Description:

**Laboratory Services** 

Client Sample ID: Recycle Lab Sample ID:

Water

Sampled:

12/11/12 08:45

Matrix:

1212202-02

Sampled By: Received:

A.V. 12/12/12 10:00

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	40	20	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215419
Alkalinity, Carbonate	<2.0	2.0	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215420
Bromide	920	600	mg/L	200	ASTM D 1246-95 (99)	12/26/12 11:30	KAR	1215789
Conductivity @ 25° C	213200	5	umhos/cm	1	SM 2510 B 20th	12/13/12 10:43	HLB	1215309
Sulfate	2500	500	mg/L	100	ASTM 0516-90 (02)	12/13/12 10:53	LMA	1215349
Alkalinity, Total	40	20	mg/L	1	SM 2320 B 20th	12/17/12 13:30	SKA	1215421
Chloride	170000	2500	mg/L	2500	SM 4500-CI E 20th	12/21/12 09:59	LMA	1215651
*pH	6.7	1.0	pH Units	1	SM 4500-H B 20th	12/13/12 12:50	SKA	1215321
Residue, Dissolved @ 180° C	311000	5000	mg/L	1	SM 2540 C 20th	12/13/12 16:00	WAH	1215341
*Oxidation/Reduction Potential	106	1	m۷	1	ASTM D 1498-76	12/14/12 09:10	LMA	1215370
Specific Gravity	1.2128	0.7000	@ 60 °F	1	ASTM D 1429-79	12/13/12 14:10	HLB	1215331
Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	12/24/12 15:43	KAR	1215794
Sulfide, Total	3.2	1.0	mg/L	1	SM 4500-S2 F 20th	12/18/12 15:00	KAR	1215743



#### STATEMENT OF DATA QUALIFICATIONS

#### Total Metals by EPA 6000/7000 Series Methods

**Qualification:** The RL for this analysis has been elevated due to sample matrix interference.

Analysis: USEPA-6010C

Sample/Analyte: 1212202-01 Disposal Cobalt

Disposal 1212202-01 Copper 1212202-01 Disposal Lead Disposal 1212202-01 Zinc 1212202-02 Recycle Cobalt 1212202-02 Recycle Copper 1212202-02 Recycle Lead 1212202-02 Recycle Zinc

Analysis: USEPA-6020A

Sample/Analyte: 1212202-01 Disposal Selenium

1212202-02 Recycle Selenium



#### STATEMENT OF DATA QUALIFICATIONS

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Qualification: The referenced method requires analysis occur immediately after sample collection. Because

analysis was not performed in the field, the reported result must be considered estimated.

Analysis: ASTM D 1498-76

Sample/Analyte: 1212202-01

212202-01 Disposal

Recycle

Oxidation/Reduction Potential

Oxidation/Reduction Potential

Analysis: SM 4500-H B 20th

Sample/Analyte: 1212202-01

Disposal

pН

1212202-02

1212202-02

Recycle

pΗ

Qualification: The following reported test methods and analyte(s) are exceptions to our NELAP Fields of Accreditation,

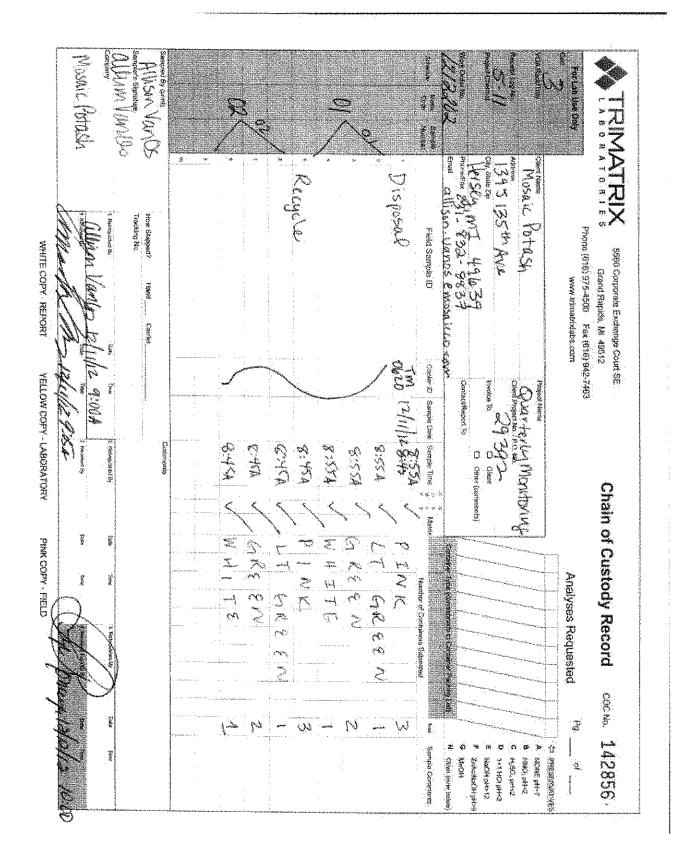
or for which accreditation is not required, applicable, or available.

Analysis: ASTM D 1429-79 Analyte(s): Specific Gravity

Analysis: ASTM D 1498-76

Analyte(s): Oxidation/Reduction Potential







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Present / Not intact	Present / Nes insact	C Present / Hact  Present / Hact Intact	C Present / Not intact
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( 1978-1985	containers have headspace?	12/12/12/10:00 13/1	2/12/1/03 Yes (No.)
Canadam Co.	ations i containers not listed on COC?	1 1 X 1 1 (X 1 1 X X 1 X X X X X X X X X	210511 50 Sec

Page 9 of 10



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COC Line #7 COC Line #9 COC Line #9 COC Line #10 Comments  Container Type Tag Color Preservative Expected pH	LI. Blue NaOH	8lue H₂50₄	Date: - 13 Brown H <sub>2</sub> SO <sub>2</sub>	DO NOT AC	6 Red HNOs	15 Red Stripe HNO <sub>3</sub>	WER TYPES	approved by Proside acid acid or base sample to achier pH. Add up to the exceed 2x the whole acid acid acid acid acid acid acid acid	to the ve the correct out do not stude initially commended initially commended initially commended in the correct of the corre
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COC Line #7 COC Line #8 COC Line #10 COC Line #1 COC Line #2 COC Line #2	LI. Blue NaOH	8lue H₂50₄	Date: - 13 Brown H <sub>2</sub> SO <sub>2</sub>	DO NOT AC	6 Red HNOs	15 Red Stripe HNO <sub>3</sub>	WER TYPES	approved by Prosed acid acid or base sample to achie pH. Add up to, exceed 2x the veaded at contain table below for it used). Add orar sample container information required adjusted form. Do not accontainer types  Container Type 5  500  1000  Container Type 4	to the return the correct of the cor
COC Line #7  COC Line #8  COC Line #10  Simments  COC Line #10  Coc Line #10	LI. Blue NaOH	8lue H₂50₄	Date: - 13 Brown H <sub>2</sub> SO <sub>2</sub>	DO NOT AC	6 Red HNOs	15 Red Stripe HNO <sub>3</sub>	WER TYPES	approved by Proside add acid or base sample to achier pH. Add up to, exceed 2x the wadded at contain table below for it used). Add oran sample container information requirectorid adjusted form. Do not ad container types  Container Size (mL)  Container Type 5  500  1000  Container Type 4  125	to the ve the correct out do not obtaine initially a property of the correct of t
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COC Line #7 COC Line #6 COC Line #10 COC Line #10 COC Line #10 Container Type Tag Color Preservative Expected pH COC Line #1 COC Line #2 COC Line #3 COC Line #4	LI. Blue NaOH	8lue H₂50₄	Date: - 13 Brown H <sub>2</sub> SO <sub>2</sub>	DO NOT AC	6 Red HNOs	15 Red Stripe HNO <sub>3</sub>	MER TYPES	approved by Prosend acid or base sample to achie pH. Add up to, exceed 2x the ve added at contains table below for it used). Add orar sample contains information required adjusted form. Do not ac container types  Container Type 5  500  1000  Container Type 4  125  250  500	to the ve the correct out do not be control of n

Page 10 of 10



October 12, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn:

Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002

Monthly Report for September 2012



OCT 1 6 2012



During the month of September, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 28 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 29 days this month.
- Cavity KCI 1060 was not in operation for this month.
- Cavity KCl 2030 was in operation for 29 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 29 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- 2. Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments



OCT 1 6 2012

## **CAVITY 1010**

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OCT 1 6 2012

#### Cavity 1010

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
/1-Sep-12	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in



OCT 16 2012

## CAVITY 1020

RECEVED

001 18 2012

Cavity 1020

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Sep-12	1103	231	276
2-Sep-12	1086	230	278
3-Sep-12	1039	238	295
4-Sep-12	1041	188	112
5-Sep-12	1100	196	251
6-Sep-12	1133	221	221
7-Sep-12	1096	241	250
8-Sep-12	1063	243	305
9-Sep-12	1097	235	290
10-Sep-12	1145	224	283
11-Sep-12	1146	212	289
12-Sep-12	1118	222	316
13-Sep-12	1069	247	309
14-Sep-12	shut in	shut in	shut in
15-Sep-12	1102	331	390
16-Sep-12	1120	299	384
17-Sep-12	1022	312	382
18-Sep-12	1044	291	350
19-Sep-12	1085	263	354
20-Sep-12	shut in	shut in	shut in
21-Sep-12	1020	175	236
22-Sep-12	1023	292	361
23-Sep-12	1025	289	368
24-Sep-12	1105	289	363
25-Sep-12	1143	285	362
26-Sep-12	1134	308	407
27-Sep-12	1097	327	414
28-Sep-12	1161	328	401
29-Sep-12	1083	322	395
30-Sep-12	1149	J 332	406



OCT 1 6 2012

#### Cavity 1020

Sep-12 Monthly Averages

Injection Pressure (psi) 1091 Injection Flow (gpm)

Return Flow (gpm)

263

323

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

28-Sep-12

1161

328

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

21-Sep-12

1020

175

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

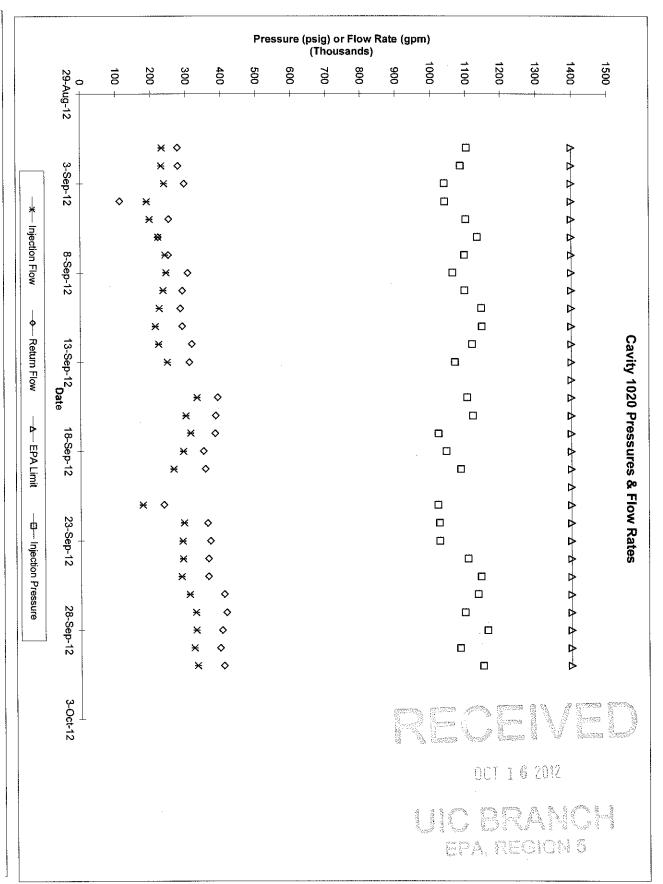
30-Sep-12

332

1149



OCT 1 6 2012



## CAVITY 1040

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OCT 1 6 2012

#### Cavity 1040

#### **Daily Averages**

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Sep-12	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in



OCT 1 & 2012

UICBRANCH EPA RECONS

## **CAVITY 1050**

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OCT 1 6 2012

Cavity 1050

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Sep-12	1163	157	157
2-Sep-12	1145	144	144
3-Sep-12	1195	178	178
4-Sep-12	1200	172	172
5-Sep-12	1183	203	203
6-Sep-12	1213	199	199
7-Sep-12	1195	178	178
8-Sep-12	1195	170	170
9-Sep-12	1200	176	176
10-Sep-12	1200	192	192
11-Sep-12	1195	186	186
12-Sep-12	1195	172	172
13-Sep-12	1173	144	144
14-Sep-12	shut in	shut in	shut in
15-Sep-12	1200	110	110
16-Sep-12	1163	175	175
17-Sep-12	1188	169	169
18-Sep-12	1183	161	161
19-Sep-12	1133	188	188
20-Sep-12	1083	138	138
21-Sep-12	1180	145	145
22-Sep-12	1190	155	155
23-Sep-12	1190	141	141
24-Sep-12	1170	159	159
25-Sep-12	1160	203	203
26-Sep-12	1175	167	167
27-Sep-12	1200	198	198
28-Sep-12	1183	182	182
29-Sep-12	1150	180	180
30-Sep-12	1175	189	189



OCT 1 G 2012

#### Cavity 1050

Sep-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1178

170

170

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Sep-12

1213

199

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

20-Sep-12

1083

138

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

5-Sep-12

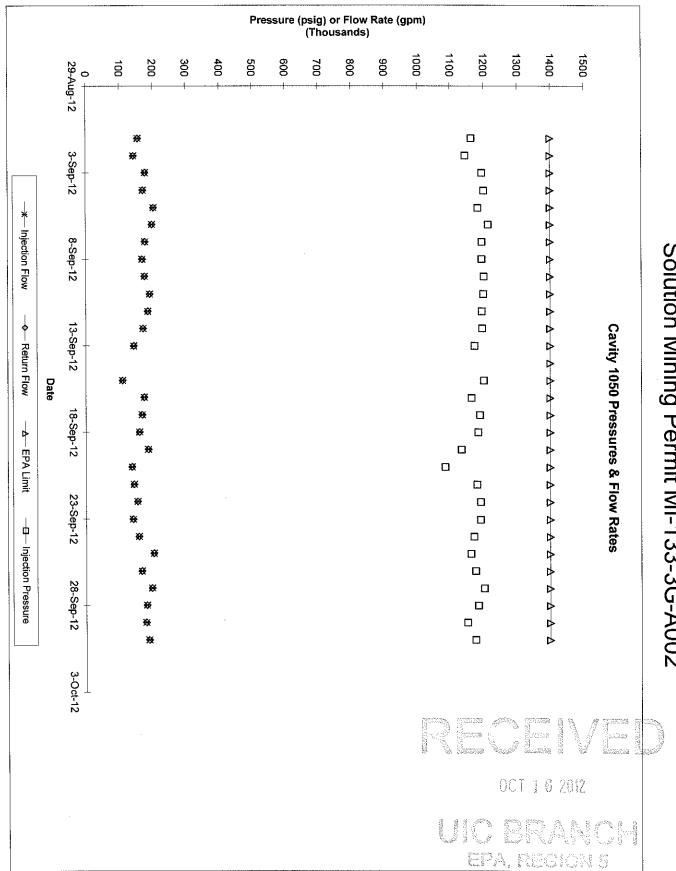
203

1183



OCT 1 6 2012

UIC BRANCH EPA, REGION 5



### **CAVITY 1060** /

OCT 1 0 2012

UC BRANCH EPA REGIONS

#### Cavity 1060

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Sep-12	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in



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### **CAVITY 2030** <

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Cavity 2030

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Sep-12	1163	243	243
2-Sep-12	1145	243	243
3-Sep-12	1195	264	264
4-Sep-12	1200	250	250
5-Sep-12	1183	250	250
6-Sep-12	1213	250	250
7-Sep-12	1195	285	285
8-Sep-12	1195	285	285
9-Sep-12	1200	285	285
10-Sep-12	1200	271	271
11-Sep-12	1195	257	257
12-Sep-12	1195	271	271
13-Sep-12	1173	285	285
14-Sep-12	shut in	shut in	shut in
15-Sep-12	1200	257	257
16-Sep-12	1163	V 315	315
17-Sep-12	1188	265	265
18-Sep-12	1183	268	268
19-Sep-12	1133	260	260
20-Sep-12	1083	261	261
21-Sep-12	1180	227	227
22-Sep-12	1190	284	284
23-Sep-12	1190	267	267
24-Sep-12	1170	268	268
25-Sep-12	1160	273	273
26-Sep-12	1175	265	265
27-Sep-12	1200	284	284
28-Sep-12	1183	250	250
29-Sep-12	1150	275	275
30-Sep-12	1175	254	254



OCT 1 6 2012

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#### Cavity 2030

Sep-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1178

266

266

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Sep-12

1213

250

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

20-Sep-12

1083

261

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

16-Sep-12

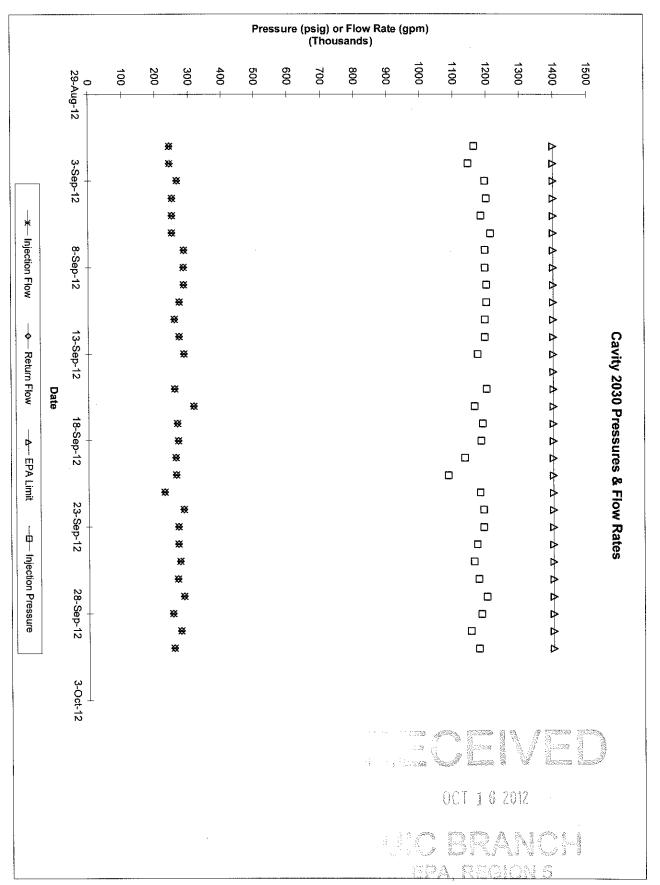
315

1163



OCT 1 6 2012

UIC BRANCH EPA, REGION 5



### CAVITY 2040

ÜCT 1 6 2012

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#### Cavity 2040

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
Date	(psi)	√(gpm)	(gpm)
1-Sep-12	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in



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### **CAVITY 2061**

OCT 1 6 2912

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Cavity 2061

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Sep-12	1163	98	98
2-Sep-12	1145	97	97
3-Sep-12	1200	35	35
4-Sep-12	1200	38	38
5-Sep-12	1200	42	42
6-Sep-12	1213	103	103
7-Sep-12	1195	59	59
8-Sep-12	1195	69	69
9-Sep-12	1200	71	71
10-Sep-12	1200	97	97
11-Sep-12	1195	78	78
12-Sep-12	1195	49	49
13-Sep-12	1180	58	58
14-Sep-12	shut in	shut in	shut in
15-Sep-12	1200	112	112
16-Sep-12	1150	63	63
17-Sep-12	1175	95	95
18-Sep-12	1183	75	75
19-Sep-12	1133	71	71
20-Sep-12	1083	154	154
21-Sep-12	1180	119	119
22-Sep-12	1190	58	58
23-Sep-12	1200	69	69
24-Sep-12	1170	88	88
25-Sep-12	1160	76	76
26-Sep-12	1175	113	113
27-Sep-12	1200	108	108
28-Sep-12	1183	123	123
29-Sep-12	1150	130	130
30-Sep-12	1175	112	112



OCT 1 6 2012

UIC BRANCH EPA, REGION 5

#### Cavity 2061

Sep-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1179

85

85

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Sep-12

1213

103

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

20-Sep-12

1083

154

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (psi)

Injection Pressure (psi)

20-Sep-12

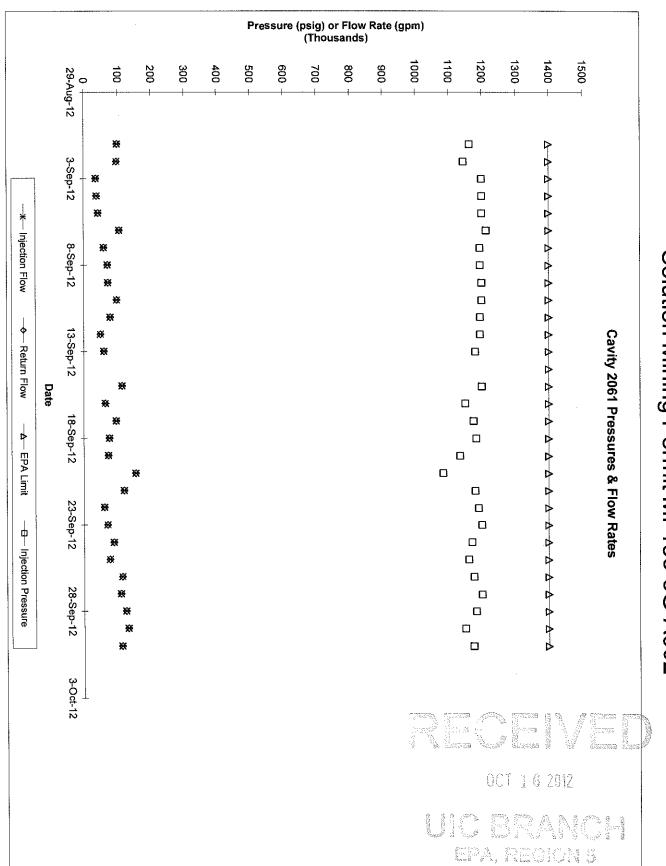
154

1083



OCT 3 G 2012

UIC BRANCH EPA REGION 5



### CAVITY 2062

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OCT 1 6 2012

UIC BRANCH

#### Cavity 2062

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Sep-12	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in



OCT 1 6 2012



OCT 1 & 2012

UC BRANCH

EPA REGIONS



October 12, 2012

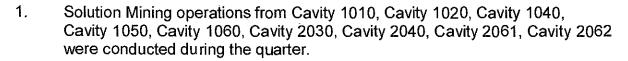
United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: Lisa Perenchio

SUBJ: Third Quarter Report - Solution Mining Wells

For the period of July 1, 2012 - September 30, 2012

Permit No.: MI-133-3G-A002



- 2. Well re-work reports for all well workovers during the period were submitted under separate cover by Doug Patulski, Minefield Superintendent.
- 3. The flowrates to and from the solution mining wells are monitored continuously. The required quarterly well injection/return balance demonstrations for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062 are attached.
- 4. The fluid level in the injection zone is "at surface".
- Attached are copies of the well fluid chemical analyses for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062.
- 6. Attached are the chemical analyses of the fluid samples obtained from the ground water monitoring wells.



OCT 1 6 2012

UIC BRANCH EPARLEION 5 The requirements of Part I (E)(10), Part II (B)(2) and Part III (C)(3) of Permit No. Ml-133-3G-A002 are being met. The samples and measurements are representative of the monitoring activity and the analysis complies with the methods and procedures approved in the Waste Analysis Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please contact me at (231) 832-8800 if you have any questions.

Sincerely,

Doug Patulski

Minefield Superintendent

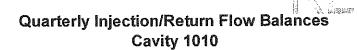
**Attachments** 

Karl Tomaszewski Site Manager

RESEMED

OCT 1 5 2012

UIC BRANCH EPA, REGIONS



OCT 16 2012

shut in

shut in

shut in

shut in

shut in

shut in

Date	Injection Flow	Dilution Flow	Total Injection Flow	Return Flow	Ratio Inj/Ret	
1-Jul-12	shut in	shut in	shut in	shut in	shut in	
2-Jul-12	shut in	shut in	shut in	shut in	shut in	
3-Jul-12	shut in	shut in	shut in	shut in	shut in	
4-Jul-12	shut in	shut in	shut in	shut in	shut in	
5-Jul-12	shut in	shut in	shut in	shut in	shut in	
6-Jul-12	shut in	. shut in	shut in	shut in	shut in	
7-Jul-12	shut in	shut in	shut in	shut in	shut in	
8-Jul-12	shut in	shut in	shut in	shut in	shut in	
9-Jul-12	shut in	shut in	shut in	shut in	shut in	
10-Jul-12	shut in	shut in	shut in	shut in	shut in	
11-Jul-12	shut in	shut in	shut in	shut in	shut in	
12-Jul-12	shut in	shut in	shut in	shut in	shut in	
13-Jul-12	shut in	shut in	shut in	shut in	shut in	
14-Jul-12	shut in	shut in	shut in	shut in	shut in	
15-Jul-12	shut in	shut in	shut in	shut in	shut in	
16-Jul-12	shut in	shut in	shut in	shut in	shut in	
17-Jul-12	shut in	shut in	shut in	shut in	shut in	
18-Jul-12	shut in	shut in	shut in	shut in	shut in	
19-Jul-12	shut in	shut in	shut in	shut in	shut in	
20-Jul-12	shut in	shut in	shut in	shut in	shut in	
21-Jul-12	shut in	shut in	shut in	shut in	shut in	
22-Jul-12	shut in	shut in	shut in	shut in	shut in	
23-Jul-12	shut in	shut in	shut in	shut in	shut in	
24-Jul-12	shut in	shut in	shut in	shut in	shut in	
25-Jul-12	shut in	shut in	shut in	shut in	shut in	
26-Jul-12	shut in	shut in	shut in	shut in	shut in	
27-Jul-12	shut in	shut in	shut in	shut in	shut in	
28-Jul-12	shut in	shut in	shut in	shut in	shut in	
29-Jul-12	shut in	shut in	shut in	shut in	shut in	
30-Jul-12	shut in	shut in	shut in	shut in	shut in	
31-Jul-12	shut in	shut in	shut in	shut in	shut in	
1-Aug-12	shut in	shut in	shut in	shut in	shut in	
2-Aug-12	shut in	shut in	shut in	shut in	shut in	
3-Aug-12	shut in	shut in	shut in	shut in	shut in	
4-Aug-12	shut in	shut in	shut in	shut in	shut in	
5-Aug-12	shut in	shut in	shut in	shut in	shut in	
6-Aug-12	shut in	shut in	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	shut in	shut in	
10-Aug-12	shut in	shut in	shut in	shut in	shut in	
11-Aug-12	shut in	shut in	shut in	shut in	shut in	
12-Aug-12	shut in	shut in	shut in	shut in	shut in	
12 10 12	abut in	abut in	obut in	chut in	chut in	

13-Aug-12

14-Aug-12

shut in

shut in

shut in

shut in

15-Aug-12	shut in	shut in	shut in	shut in	shut in
16-Aug-12	shut in	shut in	shut in	shut in	shut in
17-Aug-12	shut in	shut in	shut in	shut in	shut in
18-Aug-12	shut in	shut in	shut in	shut in	shut in
19-Aug-12	shut in	shut in	shut in	shut in	shut in
20-Aug-12	shut in	shut in	shut in	shut in	shut in
21-Aug-12	shut in	shut in	shut in	shut in	shut in
22-Aug-12	shut in	shut in	shut in	shut in	shut in
23-Aug-12	shut in	shut in	shut in	shut in	shut in
24-Aug-12	shut in	shut in	shut in	shut in	shut in
25-Aug-12	shut in	shut in	shut in	shut in	shut in
26-Aug-12	shut in	shut in	shut in	shut in	shut in
27-Aug-12	shut in	shut in	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut in	shut in	shut in
31-Aug-12	shut in	shut in	shut in	shut in	shut in
1-Sep-12	shut in	shut in	shut in	shut in	shut in
2-Sep-12	shut in	shut in	shut in	shut in	shut in
3-Sep-12	shut in	shut in	shut in	shut in	shut in
4-Sep-12	shut in	shut in	shut in	shut in	shut in
5-Sep-12	shut in	shut in	shut in	shut in	shut in
6-Sep-12	shut in	shut in	shut in	shut in	shut in
7-Sep-12	shut in	shut in	shut in	shut in	shut in
8-Sep-12	shut in	shut in	shut in	shut in	shut in
9-Sep-12	shut in	shut in	shut in	shut in	shut in
10-Sep-12	shut in	shut in	shut in	shut in	shut in
11-Sep-12	shut in	shut in	shut in	shut in	shut in
12-Sep-12	shut in	shut in	shut in	shut in	shut in
13-Sep-12	shut in	shut in	shut in	shut in	shut in
14-Sep-12	shut in	shut in	shut in	shut in	shut in
15-Sep-12	shut in	shut in	shut in	shut in	shut in
16-Sep-12	shut in	shut in	shut in	shut in	shut in
17-Sep-12	shut in	shut in	shut in	shut in	shut in
18-Sep-12	shut in	shut in	shut in	shut in	shut in
19-Sep-12	shut in	shut in	shut in	shut in	shut in
20-Sep-12	shut in	shut in	shut in	shut in	shut in
21-Sep-12	shut in	shut in	shut in	shut in	shut in
22-Sep-12	shut in	shut in	shut in	shut in	shut in
23-Sep-12	shut in	shut in	shut in	shut in	shut in
24-Sep-12	shut in	shut in	shut in	shut in	shut in
25-Sep-12	shut in	shut in	shut in	shut in	shut in
26-Sep-12	shut in	shut in	shut in	shut in	shut in
27-Sep-12	shut in	shut in	shut in	shut in	shut in
28-Sep-12	shut in	shut in	shut in	shut in	shut in
29-Sep-12	shut in	shut in	shut in	shut in	shut in
30-Sep-12	shut in	shut in	shut in	shut in	shut in
Averages	shut in	shut in	shut in	shut in	shut in
Averages	SHULIH	SHUL III	SHULIH	onut m	SHULHI

	Injoction	Dilution	Total	Return	Ratio
Date	Injection Flow	Flow	Injection Flow	Flow	Inj/Ret
1-Jul-12	194	4.6	199	207	0.96
2-Jul-12	214	4.6	219	246	0.89
3-Jul-12	324	4.8	329	373	0.88
4-Jul-12	340	4.9	345	359	0.96
5-Jul-12	332	4.3	336	358	0.94
6-Jul-12	331	4.9	336	370	0.91
7-Jul-12	336	5.4	341	368	0.93
8-Jul-12	338	5:7	344	377	0.91
9-Jul-12	269	5.3	274	279	0.98
10-Jul-12	217	5.1	222	229	0.97
11-Jul-12	211	5.0	216	236	0.92
12-Jul-12	86	5.6	92	203	0.45
13-Jul-12	195	3.9	199	132	1.51
14-Jul-12	219	3.7	223	213	1.05
15-Jul-12	200	0.0	200	217	0.92
16-Jul-12	66	0.0	66	73	0.90
17-Jul-12	shut in	shut in	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut in	shut in	shut in
21-Jul-12	shut in	shut in	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in	shut in	shut in
27-Jul-12	shut in	shut in	shut in	shut in	shut in
28-Jul-12	shut in	shut in	shut in	shut in	shut in
29-Jul-12	shut in	shut in	shut in .	shut in	shut in
30-Jul-12	shut in	shut in	shut in	shut in	shut in
31-Jul-12	shut in	shut in	shut in	shut in	shut in
1-Aug-12	shut in	shut in	shut in	shut in	shut in
2-Aug-12	136	0.0	136	155	0.88
3-Aug-12	shut in	shut in	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in	shut in	shut in

15-Aug-12	shut in				
16-Aug-12	shut in				
17-Aug-12	shut in				
18-Aug-12	shut in				
19-Aug-12	shut in				
20-Aug-12	shut in				
21-Aug-12	shut in				
22-Aug-12	227	4.6	232	253	0.92
23-Aug-12	212	1.9	214	259	0.83
24-Aug-12	35	1.9	37	41	0.90
25-Aug-12	106	5.4	111	138	0.81
26-Aug-12	207	8.6	216	235	0.92
27-Aug-12	183	6.1	189	230	0.82
28-Aug-12	241	8.8	250	320	0.78
29-Aug-12	262	0.0	262	298	0.88
30-Aug-12	239	0.0	239	268	0.89
31-Aug-12	230	2.4	232	272	0.85
1-Sep-12	231	3.0	234	276	0.85
2-Sep-12	230	6.8	237	278	0.85
3-Sep-12	238	9.5	248	295	0.84
4-Sep-12	188	6.9	195	112	1.74
5-Sep-12	196	3.6	200	251	0.80
6-Sep-12	221	5.5	227	221	1.02
7-Sep-12	241	0.0	241	250	0.96
8-Sep-12	243	0.0	243	305	0.80
9-Sep-12	235	0.0	235	290	0.81
10-Sep-12	224	5.6	230	283	0.81
11-Sep-12	212	5.0	217	289	0.75
12-Sep-12	222	6.4	228	316	0.72
13-Sep-12	247	5.8	253	309	0.82
14-Sep-12	shut in				
15-Sep-12	331	6.0	337	390	0.86
16-Sep-12	299	6.2	305	384	0.79
17-Sep-12	312	0.0	312	382	0.82
18-Sep-12	291	0.0	291	350	0.83
19-Sep-12	263	1,2	264	354	0.75
20-Sep-12	shut in				
21-Sep-12	175	1.5	177	236	0.75
22-Sep-12	292	2.2	294	361	0.81
23-Sep-12	289	5.5	295	368	0.80
24-Sep-12	289	4.9	294	363	0.81
25-Sep-12	285	4.4	289	362	0.80
26-Sep-12	308	6.0	314	407	0.77
27-Sep-12	327	0.0	327	414	0.79
28-Sep-12	328	4.0	332	401	0.83
29-Sep-12	322	5.0	327	395	0.83
30-Sep-12	332	5.0	337	406	0.83
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Averages	242	4.0	243	286	0.88
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	Injection	Dilution	Total Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
Total and the second se			To the second se	Parameter and the second and the sec	mjrtot
1-Jul-12	shut in	shut in	shut in	shut in	shut in
2-Jul-12	shut in	shut in	shut in	shut in	shut in
3-Jul-12	shut in	shut in	shut in	shut in	shut in
4-Jul-12	shut in	shut in	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shut in	shut in	shut in
7-Jul-12	shut in	shut in	shut in	shut in	shut in
8-Jul-12	shut in	shut in	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in	shut in	shut in
10-Jul-12	shut in	shut in	shut in	shut in	shut in
11-Jul-12	shut in	shut in	shut in	shut in	shut in
12-Jul-12	shut in	shut in	shut in	shut in	shut in
13-Jul-12	shut in	shut in	shut in	shut in	shut in
14-Jul-12	shut in	shut in	shut in	shut in	shut in
15-Jul-12	shut in	shut in	shut in	shut in	shut in
16-Jul-12	shut in	shut in	shut in	shut in	shut in
17-Jul-12	shut in	shut in	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut in	shut in	shut in
21-Jul-12	shut in	shut in	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in	shut in	shut in
27-Jul-12	shut in	shut in	shut in	shut in	shut in
28-Jul-12	shut in	shut in	shut in	shut in	shut in
29-Jul-12	shut in	shut in	shut in	shut in	shut in
30-Jul-12	shut in	shut in	shut in	shut in	shut in
31-Jul-12	shut in	shut in	shut in	shut in	shut in
1-Aug-12	shut in	shut in	shut in	shut in	shut in
2-Aug-12	shut in	shut in	shut in	shut in	shut in
3-Aug-12	shut in	shut in	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in	shut in	shut in

Averages	shut in				
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30-Sep-12	shut in				
29-Sep-12	shut in				
28-Sep-12	shut in				
27-Sep-12	shut in				
26-Sep-12	shut in				
25-Sep-12	shut in				
24-Sep-12	shut in				
23-Sep-12	shut in				
22-Sep-12	shut in				
21-Sep-12	shut in				
20-Sep-12	shut in				
19-Sep-12	shut in				
18-Sep-12	shut in				
17-Sep-12	shut in				
16-Sep-12	shut in				
15-Sep-12	shut in				
14-Sep-12	shut in				
13-Sep-12	shut in				
12-Sep-12	shut in	shut in	shut in	shut in	<b>s</b> hut in
11-Sep-12	shut in				
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9-Sep-12	shut in				
8-Sep-12	shut in				
7-Sep-12	shut in				
6-Sep-12	shut in				
5-Sep-12	shut in				
4-Sep-12	shut in				
3-Sep-12	shut in				
2-Sep-12	shut in				
1-Sep-12	shut in				
31-Aug-12	shut in				
30-Aug-12	shut in				
29-Aug-12	shut in				
28-Aug-12	shut in				
27-Aug-12	shut in				
26-Aug-12	shut in				
25-Aug-12	shut in				
24-Aug-12	shut in				
23-Aug-12	shut in				
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21-Aug-12	shut in				
20-Aug-12	shut in				
19-Aug-12	shut in				
18-Aug-12	shut in				
17-Aug-12	shut in				
16-Aug-12	shut in				
15-Aug-12	shut in				
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Date	Injection Flow	Dilution Flow	Total Injection Flow	Return Flow	Ratio Inj/Ret
		parameter and the second secon	T TOYY	(2000)	A JACOC
1-Jul-12	125	5.9	131	125	1.05
2-Jul-12	176	3.9	180	176	1.02
3-Jul-12	161	3.6	165	161	1.02
4-Jul-12	146	4.6	151	146	1:03
5-Jul-12	149	4.5	154	149	1.03
6-Jul-12	150	3.8	154	150	1.03
7-Jul-12	149	3.9	153	149	1.03
8-Jul-12	154	4.2	158	154	1.03
9-Jul-12	140	5.5	146	140	1.04
10-Jul-12	133	5.6	139	133	1.04
11-Jul-12	130	5.2	135	130	1.04
12-Jul-12	114	3.3	117	114	1.03
13-Jul-12	84	2.2	86	84	1.03
14-Jul-12	161	5.3	166	161	1.03
15-Jul-12	157	0.0	157	157	1.00
16-Jul-12	152	0.0	152	152	1.00
17-Jul-12	170	4.8	175	170	1.03
18-Jul-12	189	5.7	195	189	1.03
19-Jul-12	177	6.0	183	177	1.03
20-Jul-12	165	5.1	170	165	1.03
21-Jul-12	166	4.3	170	166	1.03
22-Jul-12	151	4.3	155	151	1.03
23-Jul-12	154	0.0	154	154	1.00
24-Jul-12	151	0.0	151	151	1.00
25-Jul-12	157	4.3	161	157	1.03
26-Jul-12	199	5.3	204	199	1.03
27-Jul-12	174	5.6	180	174	1.03
28-Jul-12	175	5.7	181	175	1.03
29-Jul-12	175	5.9	181	175	1.03
30-Jul-12	162	5.2	167	162	1.03
31-Jul-12	160	5.1	165	160	1.03
1-Aug-12	154	0.0	154	154	1.00
2-Aug-12	160	0.0	160	160	1.00
3-Aug-12	154	5.8	160	154	1.04
4-Aug-12	169	4.9	174	169	1.03
5-Aug-12	16	3.0	19	16	1.19
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	244	6.0	250	244	1.02
11-Aug-12	156	0.0	156	156	1.00
12-Aug-12	154	0.0	154	154	1.00
13-Aug-12	181	1.3	182	181	1.01
14-Aug-12	195	5.9	201	195	1.03

15-Aug-12	180	6.1	186	180	1.03
16-Aug-12	170	6.1	176	170	1.04
17-Aug-12	201	6.1	207	201	1.03
18-Aug-12	193	5.9	199	193	1.03
19-Aug-12	181	6.4	187	181	1.04
20-Aug-12	172	0.0	172	172	1.00
21-Aug-12	165	0.0	165	165	1.00
22-Aug-12	143	3.7	147	143	1.03
23-Aug-12	138	5.3	143	138	1.04
24-Aug-12	23	1.4	24	23	1.06
25-Aug-12	80	5.8	86	. 80	1.07
26-Aug-12	160	7.6	168	160	1.05
27-Aug-12	175	5.5	181	175	1.03
28-Aug-12	203	6.7	210	203	1.03
29-Aug-12	168	0.0	168	168	1.00
30-Aug-12	149	0.0	149	149	1.00
31-Aug-12	154	1.8	156	154	1.01
1-Sep-12	157	1.9	159	157	1.01
2-Sep-12	144	6.7	151	144	1.05
3-Sep-12	. 178	0.0	178	178	1.00
4-Sep-12	172	0.0	172	172	1.00
5-Sep-12	203	5.7	209	203	1.03
6-Sep-12	199	3.5	203	199	1.02
7-Sep-12	178	0.0	178	178	1.00
8-Sep-12	170	0.0	170	170	1.00
9-Sep-12	176	0.0	176	176	1.00
10-Sep-12	192	2.7	195	192	1.01
11-Sep-12	186	5.9	192	186	1.03
12-Sep-12	172	0.0	172	172	1.00
13-Sep-12	144	2.5	147	144	1.02
14-Sep-12	shut in				
15-Sep-12	110	5.3	115	110	1.05
16-Sep-12	175	4.3	179	175	1.02
17-Sep-12	169	0.0	169	169	1.00
18-Sep-12	161	0.0	161	161	1.00
19-Sep-12	188	5.2	193	188	1.03
20-Sep-12	138	0.0	138	138	1.00
21-Sep-12	145	0.0	145	145	1.00
22-Sep-12	155	4.2	159	155	1.03
23-Sep-12	141	2.7	144	141	1.02
24-Sep-12	159	2.6	162	159	1.02
25-Sep-12	203	2.9	206	203	1.01
26-Sep-12	167	2.0	169	167	1.01
27-Sep-12	198	0.0	198	198	1.00
28-Sep-12	182	5.3	187	182	1.03
29-Sep-12	180	2.6	183	180	1.01
30-Sep-12	189	3.5	193	189	1.02
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Averages	161	3	163	160	1

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	Injection	Dibution	Total	Detum	Ratio
Date	Injection Flow	Dilution Flow	Injection Flow	Return Flow	Inj/Ret
Date	1 IOVV	FIOV	FIOW	FIOW	111/1101
1-Jul-12	215	3.9	219	211	1.04
2-Jul-12	160	0.0	160	164	0.98
3-Jul-12	shut in	shut in	shutin	shut in	shut in
4-Jul-12	shut in	shut in	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shutin	shut in	shut in
7-Jul-12	shut in	shut in	shut in	shut in	shut in
8 <b>-J</b> ul-12	shut in	shut in	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in	shut in	shut in
10-Jul-12	139	3.5	143	147	0.97
11-Jul-12	153	1.2	154	136	1.13
12-Jul-12	229	3.5	233	212	1.10
13-Jul-12	132	3.5	136	161	0.84
14-Jul-12	153	4.8	158	146	1.08
15-Jul-12	201	0.0	201	207	0.97
16-Jul-12	229	0.0	229	242	0.95
17-Jul-12	271	5.6	277	302	0.92
18-Jul-12	285	5.5	291	287	1.01
19-Jul-12	271	5.6	277	298	0.93
20-Jul-12	278	5.3	283	290	0.98
21-Jul-12	278	5.4	283	323	0.88
22-Jul-12	285	5.5	291	306	0.95
23-Jul-12	340	0.0	340	344	0.99
24-Jul-12	333	0.0	333	335	0.99
25-Jul-12	333	1.7	335	346	0.97
26-Jul-12	319	4.4	323	302	1.07
27-Jul-12	319	4.7	324	333	0.97
28-Jul-12	340	4.9	345	339	1.02
29-Jul-12	313	5.3	318	332	0.96
30-Jul-12	340	4.2	344	339	1.02
31-Jul-12	340	4.3	344	348	0.99
1-Aug-12	333	0.0	333	346	0.96
2-Aug-12	333	0.0	333	338	0.99
3-Aug-12	313	5.6	319	353	0.90
4-Aug-12	354	5.7	360	357	1.01
5-Aug-12	160	2.4	162	156	1.04
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	146	0.0	146	360	0.41
11-Aug-12	271	0.0	271	288	0.94
12-Aug-12	299	0.0	299	278	1.08
13-Aug-12	271	3.3	274	277	0.99
14-Aug-12	285	5.4	290	282	1.03
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15-Aug-12	299	5.6	305	316	0.96
16-Aug-12	285	0.0	285	315	0.90
17-Aug-12	299	5.8	305	313	0.97
18-Aug-12	354	5.6	360	320	1.12
19-Aug-12	389	5.5	395	352	1.12
20-Aug-12	306	0.0	306	361	. 0.85
21-Aug-12	285	0.0	285	330	0.86
22-Aug-12	shut in				
23-Aug-12	shut in				
24-Aug-12	shut in				
25-Aug-12	shut in				
26-Aug-12	shut in				
27-Aug-12	shut in				
28-Aug-12	shut in				
29-Aug-12	shut in				
30-Aug-12	shut in				
31-Aug-12	shut in				
1-Sep-12	shut in				
2-Sep-12	shut in				
3-Sep-12	shut in				
4-Sep-12	shut in				
5-Sep-12	shut in				
6-Sep-12	shut in				
7-Sep-12	shut in				
8-Sep-12	shut in				
9-Sep-12	shut in				
10-Sep-12	shut in				
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13-Sep-12	shut in				
14-Sep-12	shut in				
15-Sep-12	shut in				
16-Sep-12	shut in				
17-Sep-12	shut in				
18-Sep-12	shut in				
19-Sep-12	shut in				
20-Sep-12	shut in				
21-Sep-12	shut in				
22-Sep-12	shut in				
23-Sep-12	shut in				
24-Sep-12	shut in				
25-Sep-12	shut in				
26-Sep-12	shut in				
27-Sep-12	shut in				
28-Sep-12	shut in				
29-Sep-12	shut in				
· 30-Sep-12	shut in				
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			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
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1-Jul-12	259	0.0	259	259	1.00
2-Jul-12	192	0.0	192	192	1.00
3-Jul-12	223	0.0	223	223	1.00
4-Jul-12	208	0.0	208	208	1.00
5-Jul-12	222	0.0	222	222	1.00
6-Jul-12	215	0.0	215	215	1.00
7-Jul-12	229	0.0	229	229	1.00
8-Jul-12	222	0.0	222	222	1.00
9-Jul-12	210	0.0	210	210	1.00
10-Jul-12	219	0.0	219	219	1.00
11-Jul-12	211	0.0	211	211	1.00
12-Jul-12	238	0.0	238	238	1.00
13-Jul-12	136	0.0	136	136	1.00
14-Jul-12	211	0.0	211	211	1.00
15-Jul-12	214	0.0	214	214	1.00
16-Jul-12	200	0.0	200	200	1.00
17-Jul-12	226	0.0	226	226	1.00
18-Jul-12	256	0.0	256	256	1.00
19-Jul-12	206	0.0	206	206	1.00
20-Jul-12	133	0.0	133	133	1.00
21-Jul-12	shut in	shut in	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in	shut in	shut in
23-Jul-12	265	0.0	265	265	1.00
24-Jul-12	240	0.0	240	240	1.00
25-Jul-12	259	0.0	259	259	1.00
26-Jul-12	269	0.0	269	269	1.00
27-Jul-12	255	0.0	255	255	1.00
28-Jul-12	216	0.0	216	216	1.00
29-Jul-12	251	0.0	251	251	1.00
30-Jul-12	215	0.0	215	215	1.00
31-Jul-12	252	0.0	252	252	1.00
1-Aug-12	207	0.0	207	207	1.00
2-Aug-12	61	0.0	61	61	1.00
3-Aug-12	shut in	shut in	shut in	shut in	shut in
4-Aug-12	245	0.0	245	245	1.00
5-Aug-12	121	0.0	121	121	1.00
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	149	0.0	149	149	1.00
11-Aug-12	258	0.0	258	258	1.00
12-Aug-12	240	0.0	240	240	1.00
13-Aug-12	235	0.0	235	235	1.00
14-Aug-12	265	0.0	265	265	1.00
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15-Aug-12	253	0.0	253	253	1.00
16-Aug-12	267	0.0	267	267	1.00
17-Aug-12	243	0.0	243	243	1.00
18-Aug-12	278	0.0	278	278	1.00
19-Aug-12	250	0.0	250	250	1.00
20-Aug-12	250	0.0	250	250	1.00
21-Aug-12	264	0.0	264	264	1.00
22-Aug-12	250	0.0	250	250	1.00
23-Aug-12	257	0.0	257	257	1.00
24-Aug-12	69	0.0	69	69	1.00
25-Aug-12	167	0.0	167	167	1.00
26-Aug-12	215	0.0	215	215	1.00
27-Aug-12	250	0.0	250	250	1.00
28-Aug-12	260	0.0	260	260	1.00
29-Aug-12	260	0.0	260	260	1.00
30-Aug-12	236	0.0	236	236	1.00
31-Aug-12	201	0.0	201	201	1.00
1-Sep-12	243	0.0	243	243	1.00
2-Sep-12	243	0.0	243	243	1.00
3-Sep-12	264	0.0	264	264	1.00
4-Sep-12	250	0.0	250	250	1.00
5-Sep-12	250	0.0	250	250	1.00
6-Sep-12	250	0.0	250	250	1.00
7-Sep-12	285	0.0	285	285	1.00
8-Sep-12	285	0.0	285	285	1.00
9-Sep-12	285	0.0	285	285	1.00
10-Sep-12	271	0.0	271	271	1.00
11-Sep-12	257	0.0	257	257	1.00
12-Sep-12	271	0.0	271	271	1.00
13-Sep-12	285	0.0	285	285	1.00
14-Sep-12	shut in	shut in	shut in	shut in	shut in
15-Sep-12	257	0.0	257	257	1.00
16-Sep-12	315	0.0	315	315	1.00
17-Sep-12	265	0.0	265	265	1.00
18-Sep-12	268	0.0	268	268	1.00
19-Sep-12	260	0.0	260	260	1.00
20-Sep-12	261	0.0	261	261	1.00
21-Sep-12	227	0.0	227	227	1.00
22-Sep-12	284	0.0	284	284	1.00
23-Sep-12	267	0.0	267	267	1.00
24-Sep-12	268	0.0	268	268	1.00
25-Sep-12	273	0.0	273	273	1.00
26-Sep-12	265	0.0	265	265	1.00
27-Sep-12	284	0.0	284	' 284	1.00
28-Sep-12	250	0.0	250	250	1.00
29-Sep-12	275	0.0	275	275	1.00
30-Sep-12	254	0.0	254	254	1.00
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Averages	237	0.0	236	236	1.00
<b>9</b> -					

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
	Section and the Confession of	Section of the Sectio	Secretarios de la consecución dela consecución de la consecución dela consecución de la consecución de	Approximation of the Approxima	
1-Jul-12	shut in	shut in	shut in	shut in	shut in
2-Jul-12	shut in	shut in	shut in	shut in	shut in
3-Jul-12	shut in	shut in	shut in	shut in	shut in
4-Jul-12	shut in	shut in	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shut in	shut in	shut in
7-Jul-12	shut in	shut in	shut in	shut in	shut in
8-Jul-12	shut in	shut in	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in	shut in	shut in
10-Jul-12	shut in	shut in	shut in	shut in	shut in
11-Jul-12	shut in	shut in	shut in	shut in	shut in
12-Jul-12	shut in	shut in	shut in	shut in	shut in
13-Jul-12	shut in	shut in	shut in	shut in	shut in
14-Jul-12	shut in	shut in	shut in	shut in	shut in
15-Jul-12	shut in	shut in	shut in	shut in	shut in
16-Jul-12	shut in	shut in	shut in	shut in	shut in
17-Jul-12	shut in	shut in	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut in	shut in	shut in
21-Jul-12	shut in	shut in	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in	shut in	shut in
27-Jul-12	shut in	shut in	shut in	shut in	shut in
28-Jul-12	shut in	shut in	shut in	shut in	shut in
29-Jul-12	shut in	shut in	shut in	shut in	shut in
30-Jul-12	shut in	shut in	shut in	shut in	shut in
31-Jul-12	shut in	shut in	shut in	shut in	shut in
1-Aug-12	shut in	shut in	shut in	shut in	shut in
2-Aug-12	shut in	shut in	shut in	shut in	shut in
3-Aug-12	shut in	shut in	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in	shut in	shut in
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19-Aug-12 shut in shut in shut in shut in shut in shut in 17-Aug-12 shut in sh						
17-Aug-12 shut in shut in shut in shut in shut in shut in 19-Aug-12 shut in shut in shut in shut in 19-Aug-12 shut in shut in shut in shut in 19-Aug-12 shut in shut in shut in shut in shut in 19-Aug-12 shut in shut	_					
18-Aug-12 shut in shut						
19-Aug-12 shut in 21-Aug-12 shut in sh		the state of the s				
20-Aug-12						
21-Aug-12						
22-Aug-12         shut in	_					
23-Aug-12 shut in shut	=			shut in	shut in	
24-Aug-12 shut in shut	_					
25-Aug-12 shut in shut						
26-Aug-12         shut in	_		shut in	shut in		
27-Aug-12         shut in shut	•		shut in	shut in		
28-Aug-12         shut in	=		shut in	shut in	shut in	shut in
29-Aug-12         shut in	_		shut in	shut in	shut in	shut in
30-Aug-12 shut in shut	_	shut in	shut in	shut in	shut in	shut in
31-Aug-12 shut in shut in shut in shut in shut in shut in 1-Sep-12 shut in shu	_		shut in	shut in	shut in	shut in
1-Sep-12 shut in shut	_		shut in	shut in	shut in	shut in
2-Sep-12 shut in shut		shut in	shut in	shut in	shut in	shut in
3-Sep-12 shut in shut		shut in	shut in	shut in	shut in	shut in
4-Sep-12 shut in shut		shut in	shut in	shut in	shut in	shut in
5-Sep-12         shut in         <		shut in	shut in	shut in	shut in	shut in
6-Sep-12	•	shut in	shut in	shut in	shut in	shut in
7-Sep-12 shut in shut in shut in shut in shut in shut in sep-12 shut in shut i		shut in	shut in	shut in	shut in	shut in
8-Sep-12 shut in shut	6-Sep-12	shut in	shut in	shut in	shut in	shut in
9-Sep-12 shut in shut	7-Sep-12	shut in	shut in	shut in	shut in	shut in
10-Sep-12         shut in	8-Sep-12	shut in	shut in	shut in	shut in	shut in
11-Sep-12         shut in	9-Sep-12	shut in	shut in	shut in	shut in	shut in
12-Sep-12         shut in	10-Sep-12	shut in	shut in	shut in	shut in	shut in
13-Sep-12         shut in	11-Sep-12	shut in	shut in	shut in	shut in	shut in
14-Sep-12 shut in shut	12-Sep-12	shut in	shut in	shut in	shut in	shut in
15-Sep-12 shut in shut	13-Sep-12	shut in	shut in	shut in	shut in	shut in
16-Sep-12 shut in 17-Sep-12 shut in sh	14-Sep-12	shut in	shut in	shut in	shut in	shut in
17-Sep-12 shut in shut in shut in shut in shut in shut in 18-Sep-12 shut in sh	15-Sep-12	shut in	shut in	shut in	shut in	shut in
18-Sep-12 shut in shut in shut in shut in shut in shut in 19-Sep-12 shut in sh	16-Sep-12	shut in	shut in	shut in	shut in	shut in
19-Sep-12 shut in shut	17-Sep-12	shut in	shut in	shut in	shut in	shut in
20-Sep-12 shut in shut	18-Sep-12	shut in	shut in	shut in	shut in	shut in
21-Sep-12 shut in shut	19-Sep-12	shut in	shut in			shut in
21-Sep-12 shut in shut	20-Sep-12	shut in	shut in	shut in	shut in	shut in
22-Sep-12 shut in shut	21-Sep-12	shut in				shut in
Shut in Shut i						
24-Sep-12shut inshut inshut inshut in25-Sep-12shut inshut inshut inshut in26-Sep-12shut inshut inshut inshut in27-Sep-12shut inshut inshut inshut in28-Sep-12shut inshut inshut inshut in29-Sep-12shut inshut inshut inshut in30-Sep-12shut inshut inshut inshut in	23-Sep-12					
25-Sep-12shut inshut inshut inshut in26-Sep-12shut inshut inshut inshut in27-Sep-12shut inshut inshut inshut in28-Sep-12shut inshut inshut inshut in29-Sep-12shut inshut inshut inshut in30-Sep-12shut inshut inshut inshut in	-					
26-Sep-12shut inshut inshut inshut in27-Sep-12shut inshut inshut inshut in28-Sep-12shut inshut inshut inshut in29-Sep-12shut inshut inshut inshut in30-Sep-12shut inshut inshut inshut in	25-Sep-12		in the second se			
27-Sep-12shut inshut inshut inshut in28-Sep-12shut inshut inshut inshut in29-Sep-12shut inshut inshut inshut in30-Sep-12shut inshut inshut inshut in	•					
28-Sep-12 shut in	27-Sep-12					
29-Sep-12shut inshut inshut inshut in30-Sep-12shut inshut inshut inshut in	•					
30-Sep-12 shut in shut in shut in shut in shut in	•		· ·			
	•					
Averages shut in shut in shut in shut in shut in shut in	- <b>,</b> <del>-</del>		5,104,71		J //	- ( M ) ( ) ( )
	Averages	shut in	shut in	shut in	shut in	shut in

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
		emeral handrak organisa al-aram al-ara	en en est de marien en e	monitorial commission discretizations	jerele kronner dissoniere de Michilli de Maleire bere bere em
1-Jul-12	108	0.0	108	108	1.00
2-Jul-12	65	0.0	65	65	1.00
3-Jul-12	100	0.0	100	100	1.00
4-Jul-12	95	0.0	95	95	1.00
5-Jul-12	97	0.0	97	97	1.00
6-Jul-12	98	0.0	98	98	1.00
7-Jul-12	79	0.0	79	79	1.00
8-Jul-12	84	0.0	84	84	1.00
9-Jul-12	86	0.0	86	86	1.00
10-Jul-12	85	0.0	85	85	1.00
11-Jul-12	99	0.0	99	99	1.00
12-Jul-12	67	0.0	67	67	1.00
13-Jul-12	56	0.0	56	56	1.00
14-Jul-12	67	0.0	67	67	1.00
15-Jul-12	56	0.0	56	56	1.00
16-Jul-12	shut in	shut in	shut in	shut in	shut in
17-Jul-12	shut in	shut in	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in	shut in	shut in
20-Jul-12	49	0.0	49	49	1.00
21-Jul-12	192	0.0	192	192	1.00
22-Jul-12	172	0.0	172	172	1.00
23-Jul-12	shut in	shut in	shut in	shut in	shut in
24-Jul-12	92	0.0	92	92	1.00
25-Jul-12	shut in	shut in	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in	shut in	shut in
27-Jul-12	60	0.0	60	60	1.00
28-Jul-12	96	0.0	96	96	1.00
29-Jul-12	59	0.0	59	59	1.00
30-Jul-12	106	0.0	106	106	1.00
31-Jul-12	100	0.0	100	100	1.00
1-Aug-12	111	0.0	111	111	1.00
2-Aug-12	94	0.0	94	94	1.00
3-Aug-12	137	0.0	137	137	1.00
4-Aug-12	shut in	shut in	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in	shut in	shut in
11-Aug-12	66	0.0	66	66	1.00
12-Aug-12	44	0.0	44	44	1.00
13-Aug-12	shut in	shut in	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in	shut in	shut in
<b>→</b> ·=			<del></del>		

4E A 40	36	0.0	22	20	4.00
15-Aug-12	36	0.0	36	36 70	1.00
16-Aug-12	78	0.0	78	78	1.00
17-Aug-12	99	0.0	99	99	1.00
18-Aug-12	69	0.0	69	69	1.00
19-Aug-12	163	0.0	163	163	1.00
20-Aug-12	132	0.0	132	132	1.00
21-Aug-12	61	0.0	61	61	1.00
22-Aug-12	110	0.0	110	110	1.00
23-Aug-12	102	0.0	102	102	1.00
24-Aug-12	20	0.0	. 20	20	1.00
25-Aug-12	47	0.0	47	47	1.00
26-Aug-12	69	0.0	69	69	1.00
27-Aug-12	shut in	shut in	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut in	shut in	shut in
31-Aug-12	89	0.0	89	89	1.00
1-Sep-12	98	0.0	98	98	1.00
2-Sep-12	97	0.0	97	97	1.00
3-Sep-12	35	0.0	35	35	1.00
4-Sep-12	38	0.0	38	38	1.00
5-Sep-12	42	0.0	42	42	1.00
6-Sep-12	103	0.0	103	103	1.00
7-Sep-12	59	0.0	59	59	1.00
8-Sep-12	69	0.0	69	69	1.00
9-Sep-12	71	0.0	71	71	1.00
9-Зер-12 10-Sep-12	97				1.00
•		0.0	97	97 79	1.00
11-Sep-12	78 40	0.0	78	78	
12-Sep-12	<b>4</b> 9	0.0	49	49	1.00
13-Sep-12	58	0.0	58	58	1.00
14-Sep-12	shut in	shut in	shut in	shut in	shut in
15-Sep-12	112	0.0	112	112	1.00
16-Sep-12	63	0.0	63	63	1.00
17-Sep-12	95	0.0	95	95	1.00
18-Sep-12	75	0.0	75	75	1.00
19-Sep-12	71	0.0	71	71	1.00
20-Sep-12	154	0.0	154	154	1.00
21-Sep-12	119	0.0	119	119	1.00
22-Sep-12	58	0.0	58	58	1.00
23-Sep-12	69	0.0	69	69	1.00
24-Sep-12	88	0:0	88	88	1.00
25-Sep-12	76	0.0	76	76	1.00
26-Sep-12	113	0.0	113	113	1.00
27-Sep-12	108	0.0	108	108	1.00
28-Sep-12	123	0.0	123	123	1.00
29-Sep-12	130	0.0	130	130	1.00
30-Sep-12	112	0.0	112	112	1.00
	. 12	5.0	<del></del>		
Averages	87	0.0	86	87	1.00
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			Total			
	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
			All Andread September 1997 and a september 1997 and a september 1997 and a september 1997 and a september 1997			
1-Jul-12	shut in	shut in	shut in	shut in	shut in	
2-Jul-12	shut in	shut in	shut in	shut in	shut in	
3-Jul-12	shut in	shut in	shut in	shut in	shut in	
4-Jul-12	shut in	shut in	shut in	shut in	shut in	
5-Jul-12	shut in	shut in	shut in	shut in	shut in	
6-Jul-12	shut in	shut in	shut in	shut in	shut in	
7-Jul-12	shut in	shut in	shut in	shut in	shut in	
8-Jul-12	shut in	shut in	shut in	shut in	shut in	
9-Jul-12	shut in	shut in	shut in	shut in	shut in	
10-Jul-12	shut in	shut in	shut in	shut in	shut in	
11-Jul-12	shut in	shut in	shut in	shut in	shut in	
12-Jul-12	shut in	shut in	shut in	shut in	shut în	
13-Jul-12	shut in	shut in	shut in	shut in	shut in	
14-Jul-12	shut in	shut in	shut in	shut in	shut in	
15-Jul-12	shut in	shut in	shut in	shut in	shut in	
16-Jul-12	shut in	shut in	shut in	shut in	shut in	
17-Jul-12	shut in	shut in	shut in	shut in	shut in	
18-Jul-12	shut in	shut in	shut in	shut in	shut in	
19-Jul-12	shut in	shut in	shut in	shut in	shut in	
20-Jul-12	shut in	shut in	shut in	shut in	shut in	
21-Jul-12	shut in	shut in	shut in	shut in	shut in	
22-Jul-12	shut in	shut in	shut in	shut in	shut in	
23-Jul-12	shut in	shut in	shut in	shut in	shut in	
24-Jul-12	shut in	shut in	shut in	shut in	shut in	
25-Jul-12	shut in	shut in	shut in	shut in	shut in	
26-Jul-12	shut in	shut in	shut in	shut in	shut in	
27-Jul-12	shut in	shut in	shut in	shut in	shut in	
28-Jul-12	shut in	shut in	shut in	shut in	shut in	
29-Jul-12	shut in	shut in	shut in	shut in	shut in	
30-Jul-12	shut in	shut in	shut in	shut in	shut in	
31-Jul-12	shut in	shut in	shut in	shut in	shut in	
1-Aug-12	shut in	shut in	shut in	shut in	shut in	
2-Aug-12	shut in	shut in	shut in	shut in	shut in	
3-Aug-12	shut in	shut in	shut in	shut in	shut in	
4-Aug-12	shut in	shut in	shut in	shut in	shut in	
5-Aug-12	shut in	shut in	shut in	shut in	shut in	
6-Aug-12	shut in	shut in	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	shut in	shut in	
10-Aug-12	shut in	shut in	shut in	shut in	shut in	
11-Aug-12	shut in	shut in	shut in	shut in	shut in	
12-Aug-12	shut in	shut in	shut in	shut in	shut in	
13-Aug-12	shut in	shut in	shut in	shut in	shut in	
14-Aug-12	shut in	shut in	shut in	shut in	shut in	

15-Aug-12	shut in				
16-Aug-12	shut in				
17-Aug-12	shut in				
18-Aug-12	shut in				
19-Aug-12	shut in				
20-Aug-12	shut in				
21-Aug-12	shut in				
22-Aug-12	shut in				
23-Aug-12	shut in				
24-Aug-12	shut in				
25-Aug-12	shut in				
26-Aug-12	shut in				
27-Aug-12	shut in				
28-Aug-12	shut in				
29-Aug-12	shut in				
30-Aug-12	shut in				
31-Aug-12	shut in				
1-Sep-12	shut in				
2-Sep-12	shut in				
3-Sep-12	shut in	shutin	shut in	shut in	shut in
4-Sep-12	shut in				
5-Sep-12	shut in				
6-Sep-12	shut in				
7-Sep-12	shut in				
8-Sep-12	shut in				
9-Sep-12	shut in				
10-Sep-12	shut in				
11-Sep-12	shut in				
12-Sep-12	shut in				
13-Sep-12	shut in				
14-Sep-12	shut in				
15-Sep-12	shut in				
16-Sep-12	shut in				
17-Sep-12	shut in				
18-Sep-12	shut in				
19-Sep-12	shut in				
20-Sep-12	shut in				
21-Sep-12	shut in				
22-Sep-12	shut in				
23-Sep-12	shut in				
24-Sep-12	shut in				
25 <b>-</b> Sep-12	shut in				
26-Sep-12	shut in				
27-Sep-12	shut in				
28-Sep-12	shut in				
29 <b>-</b> Sep-12	shut in				
30-Sep-12	shut in				
<b>A</b>					
Averages	shut in				



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# 2012 Monitor Well Results – 3<sup>rd</sup> Quarter Cluster 1

Date	Well Number	Chloride Concentration (mg/L)
September 2012	Cluster 1 M.W. 01	468.0
September 2012	Cluster 1 M.W. 02	764.0
September 2012	Cluster 1 M.W. 03	127.6
September 2012	Cluster 1 M.W. 04	2,357.6
September 2012	Cluster 1 M.W. 05	407.7
September 2012	Cluster 1 M.W. 06	159.5
September 2012	Cluster 1 M.W. 07	317.3
September 2012	Cluster 1 M.W. 08	514.1
September 2012	Cluster 1 M.W. 09	8,242.8
September 2012	Cluster 1 M.W. 10	2,074.0
September 2012	Cluster 1 M.W. 11	647.0
September 2012	Cluster 1 M.W. 12	212.7
September 2012	Cluster 1 M.W. 13	3,332.6
September 2012	Cluster 1 M.W. 14	250.0
September 2012	Cluster 1 M.W. 34	2,836.3
September 2012	Cluster 1 M.W. 35	138.3
September 2012	Cluster 1 M.W. 36	44.3
September 2012	Cluster 1 M.W. 37	1,949.9
September 2012	Cluster 1 M.W. 38	16.0
September 2012	Cluster 1 M.W. 39	8.9
September 2012	Cluster 1 M.W. 40	241.1



OCT 16 2012





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# 2012 Monitor Well Results – 3<sup>rd</sup> Quarter Cluster 2

Date	Well Number	Chloride Concentration (mg/L)
September 2012	Cluster 2 M.W. 01	124.1
September 2012	Cluster 2 M.W. 02	Dry well
September 2012	Cluster 2 M.W. 04	70.9
September 2012	Cluster 2 M.W. 05	257.0
September 2012	Cluster 2 M.W. 06	16.0
September 2012	Cluster 2 M.W. 10	Dry well
September 2012	Cluster 2 M.W. 33	44.3

DATE SAMPLED	TIME SAMPLED	SAMPLE#	SAMPLER	NAME/SIGNATURE
9-18-12	7:45A.	<u> 11 (PP-1)</u>	Otion	Petita
9-18-12	2:10 A.C		Ontimo	Petro
9-12-12	9:10 AM	Marie Lange Lange Control Lang	atom	FF
9-18-12	9:25 A.N	عنوي بالتحد وبالمواليستكورات وبمنشق والمتهادي والمتهادية	The state of the s	- Patt
9-12-12	9:45 AM	DELTATION OF THE PROPERTY OF T	Con Francis	Pelto
9-12-17	9.55 AW	Control of the state of the sta	0.1	Park
9-12-12	INDS AN	A CONTRACTOR OF THE PROPERTY O	O-Tima	Pototer
9-18-12		78 (CL2-6)	Ontino	Polita
0-18-12	10:45 P.N	9 (CL2-4)	0-11-00	Pith
Dry Well	and the second section of the second section of the second section of the second section of the section of the	10 (GL2-2)	an ya ar ili gaga da da gaga gaga gaga ga gaga ga gaga ga ga g	And the state of t
9-18-12	11:05 A.	111 (CL1-3)	anting	Petto
9-18-12	71/20 00	And the second control of the second control	Oto P	Tal
9-12-12	11125 Ar	13 (CL1-5)	at &	15.10
9-18-12	11:45 Am	14 (CL1-7)	ations	
9-18-12	115 40 AIN	15 (CL1-1)	Calina	The state of the s
9-18-12	11250 A.C		antimo	TUDO.
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Later and the house over 1991s deposit the second section 1995 of the second second second section 1994 of 19	في من المناطقة	20 (CL1-4)	and the state of the control of the section of the	
Complete and Tourself to an extension of the first of the	والمناور في ويتر المهافر ويتناه والمنطق الماء والمتحوية بعد المتحوية المناور والمتحدث والمتحد	21 (PW94-2)	ang kapatan mangang ang mga pagang ang manggang panggang panggang panggang managang panggang panggang panggang	and the completed of the complete and an interest of a complete the complete and a complete the co
Felt and for the self-self-self-self-self-self-self-self-	mand in an and an angle of the second se	22 (PW94-1)	angga kanangan ya manggan kanangan kanang si kanana ak si kanang ak ing manan kanan kanan kanan kanan kanan ka	And your Stripe, and the Stripe of the Strip
1256年11月4日 (中国设计公司经验) [27] [28] (中国时代) 《阿拉斯特别 中国设计的企业的设计》(1254年11月)	त्त्वका स्वरं पार प्रमाणका विकास का प्रमाणका प्रमाणका विकास के क्षेत्र के किया है जिसके कि उसके कि विकास की की विकास के प्रमाणका कि किया कि कि किया कि किया कि किया कि किया क	23 (CL1-10)	and the second section of the second section is the second section of the section of the section of the second section of the secti	如果这种就是这种的,并是那种是一种的的人的种种,我们也就不是有 <sub>了</sub> 你不是不知识的人员,我们还不知识的人员,我们就是一个人,我们就是一个人的人,我们就是一个人的人,他们
(C) - (E) - (C) -	COST SECTION S	24 (T-126-1)	ing of the confliction and the printer of the property of the printer of the prin	The straight of the first of the straight of t
> च्या परण्डा द्वार्युर्वे विकास स्थानको स्थानको स्थानको स्थानको स्थानको स्थानको स्थानको स्थानको स्थानको स्थानक	#\$###\$################################	25 (CL1-12)	egaca. Linguis (14, 15, 15, 16, 16, 16, 16, 16, 16, 16, 16, 16, 16	, - 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
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ومدودة ويهدو بالأفاد للسعوب بدارا فعراج والمطالب المتحال المتحال في في بالداء بالمتحال بيها والأفاق والمعاول و		30 (CL1-13)	· · · · · · · · · · · · · · · · · · ·	The state of the s
9-18-12		√\31 (CL1-14)	(Intimes	Ritte -
9-18-12	10:40 A	M32 (PW-32)	anterno	Pello
9-18-12	LLOO A	33 (CL2-33)	OFFINA	PHS
Valler At Gaza Transmitter programme and second confliction of second delications and secon	ዸዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀዀ	34 (CL1-34)	A STATE OF THE PARTY OF THE PAR	New COST TO THE PARTY OF THE PA
COLUMN TO THE THE PROPERTY OF	· · · · · · · · · · · · · · · · · · ·	35 (MW-35)	<del>(1)                                      </del>	·····································
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Bit of the Control of	Constitution of the Constitution and Management Constitution of Constitution (American Constitution of Constit	37 (WW-37)	- Carlo and Carlo and Hilling of the South Association (Carlo and Carlo and Carlo and Carlo and Carlo and Carlo	THE PROPERTY OF THE PROPERTY CONTRACTOR OF THE PROPERTY OF THE
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erat gas <sup>cert en g</sup> ant h <sub>er</sub> at <del>frank partier slåte</del> klangsyck bygg myg 1925 en sig so <u>et i frank en he</u>		39 (MW-39)	n ya ekilikinda da masa kara ya kila ya kila da kila da kila da masa ya pilingan sa kila ya kila ya kila ya ki	namental of the second species of a missing process property in the second of the seco
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The state of the s	The second secon	41 (PW-41)	And the state of t	· · · · · · · · · · · · · · · · · · ·
	\$ . 	n vangasyn i Pility yn Haffyrian da dysiadd a gwyd aith yn diaen y dael y diaen y dael yn diaen y dael y diaen y dael y dael yn diaen y dael y	The second secon	表記さらられる ちょうけんり はらかは なられる からかた かっぱんち 日 (大田 かない 中の がいかい からからからからからからからない かんかん (大田 かんかん かんかん かっかん かっかん かっかん かっかん かっかん できない かっぱん できない かっぱん かっかん かっかん かっかん かっかん かっかん かっかん かっかん

Received in Lab By (Name/Signature)

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Date Received 9/18/12

Time Received 11:58 AM

DATE SAMPLED	TIME SAMPLED	SAMPLE #	SAMPLER NAME/S	IGNATURE
	-	1 (PP-1)		
This program better the continue of the second of the seco	· · · · · · · · · · · · · · · · · · ·	2 (PP-2)	and the properties of the second representation of the second representati	THE PROPERTY SECURITY
· · · · · · · · · · · · · · · · · · ·	·····································	3 (PP-3)	न्त्रार को निर्माण के त्या स्थापक के प्रतिकृतिक स्थापक के स्थापक क्षेत्रक क्षेत्रक क्षेत्रक क्षेत्रक क्षेत्रक क 	affarmely programmer and the same of the safe of the farmer before and a substitute of the same and the safe a
Martin Control of the	All the Control of Section 10 to	4 (W-126-1)	and to the second to the secon	terbanda (1964-1965) (1965) (1964-1966) (1964-1966) (1964-1966) (1964-1966) (1964-1966) (1964-1966) (1964-1966)
	<u> </u>	5 (W-128-2)	والمستعددين ومعروب ويباده والمعادون والمستعددة والمستعد	<b>乔沙姆尔科</b> (大学) (1994年)
Territoria del presidente del constitución de	معتيرة فبقباط لمغيب يقتده المعتو ويها هدف مسيرة 10 أخانة ترجه أمناه الدين وهذاء استندعها فالميأس ويرايط المتعدد	6 (CL2-1)	entre unter mu extrate proprieta en establica de la forta de l La forta de la	KKS200044 BBBBB 1 mm 9999 BBB 4 MBBB 9 BBB 9 BBB 9 BBB 9 BBB 9 BBB 9 BB
	ik Sabatan Herita silin ensitetsi Zil Barerlası ett İnganesi diraminesi ilgini	7 (CL2-5)	terrano (Pitral es et Promany Pros en qui tropose dus energiones en popular en proprio de mantiferance de religion I	<u>Anglistons and anti-active Compactual designations in the Compactual Compact</u>
William of the control of the contro	وياسته إراي مرايات المرايات والمرايات والمالية والمالية والمرايات والمرايات المرايات المرايات المرايات المرايات	8 (CL2-6)		
KÜRÜK 19 QUÜTÜN MENDE TÜRE TÜRE TÜRE TÜRE TÜRE TÜRE TÜRE TÜR	ÖRETTEN MENNEN FAN FOR	9 (CL2-4)	and the state of t	والمرابعة المارية والمعاونة والمرابعة والمرابعة والمرابعة والمرابعة والمرابعة والمرابعة والمرابعة والمرابعة والم
Dry Well-management of the control o	در به در	- 10 (CL2-2)	,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就是一个人,我们就会会会	والمتعاربة والمتعارب والمتعارب والمتعاربة والمتعاربة والمتعاربة والمتعاربة والمتعاربة والمتعاربة والمتعاربة والمتعاربة
Party by a service of the service of	والمناوية	11 (CL1-3)		of Marco ships and the sequence of the state of the second
Charles of the control of the contro		12 (GL1-6)	では、「大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大学の大	a decembrate to the section of the s
singed somety control promoty in the sound of the sound o	والمتعلم البادون والموسنه أرسانه والمراسية والمالية والموسوا والمتعادية والمتالية والمارات المتحدد	13 (CL1-5)	COLUMN TO STATE OF THE PROPERTY OF THE PROPERT	3554gas-palend-325pa-ba-palend-25pa-ba-palend-25pa-palend-25pa-palend-25pa-ba-palend-20pa-ba-palend-20pa-ba-pa
# 10 Parties of the County of	·····································	14 (CL1-7)	ni 1947 (drej 1945) roje po 1971 typograf (dries suite 27 magnatis trisique di filmidia de la Compressión Palasancia Sala	· · · · · · · · · · · · · · · · · · ·
	· · · · · · · · · · · · · · · · · · ·	15 (CL1-1)	CONTRACTOR OF THE PROPERTY OF	
ACIDA MENTAL MEN	anderspread to yet a fill the safe of the least of the le	16 (CL1-2)	وبالمنافقة المنافزة والمنافزة والمنافزة والمنافزة والمنافزة والمنافزة والمنافزة والمنافزة والمنافزة والمنافزة	· 哈拉克·克尔·阿尔斯·斯克尔·克克克克克克克克克克克克克克克克克克克克克克克克克克克
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and the second comments of the second section as the second section in the second section of the second section section sections.	The trick from the control of Control or specified according to the control of th	.18 (CL1-11)		والمراجعة
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tent and consequent and control of the control of t	COLUMN TO THE PROPERTY OF THE	.19 (CL1-8)	And the second s	
7-18-13		M20 (CL1-4)	The state of the s	
9-13-14		M 21 (PW94-2)	Cindens Pel	
9-18-12	TY Y	↑122 (PW94-1)	Contino felt	Que su
		m123 (CL1-10)	Chity Pets	The same of the sa
7-12-		1 (T-126-1)	Cations Pu	
unstantinen etallettesterren partition pour less sonne flegamen per	and the second s	25 (CL1-12)	CONTRACTOR OF THE PROPERTY OF	-
Later Balance		M26 (T-126-2)	A STATE OF THE PROPERTY OF THE	Jako
0-18-13		<u>m 27 (T-126-3)</u>	Costered Pet	
THE THE WAY SHE THE PROPERTY WAS AN ADVENUE OF THE PROPERTY OF	ek distrikt kommen hellen i politik den sovere mengelangi sangsangsi den sasangan besis sasangan s	28 (T126-5)	THE RESERVE THE PROPERTY OF TH	
	milyes (Magayya) (Makaya) (Makaya) (Makaya) arana kappilinin kangbi keranagi (Makaya)	~29 (T-126-4)		
ГУЗ-с-ПУ-1872-НО поэтнени деятельной итаказ В Македуу поверит		- 30 (CL1-13)		
	ang	31 (CL1-14)		Account the control of the control o
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12 Pa D allin Vantos 9/24/12 Received in Lab By (Name/Signature) Brian Heminsar Date Received

9-26-12 on ASY 2/26/12

Time Received

12:00 pm oh 15v 2/26/12



September 05, 2012

Mosaic Potash - Hersey Attn: Ms. Allison VanOs 1395 - 135th Avenue Hersey, MI 49639

### **Project: Quarterly Monitoring of Inorganic Pollutants**

Dear Ms. Allison VanOs,

Enclosed is a copy of the laboratory report for the following work order(s) received by TriMatrix Laboratories:

Work Order	Received	Description
1208383	08/22/2012	Laboratory Services

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and/or one of the following certification programs:

ACLASS DoD-ELAP/ISO17025 (#ADE-1542); Arkansas DEP (#11-054-0); Florida DEP (#E87622-24); Georgia EPD (#E87622-24); Illinois DEP (#002841); Kansas DPH (#E-10302); Kentucky DEP (#0021); Louisiana DEP (#03068); Michigan DPH (#0034); Minnesota DPH (#367345); New York ELAP (#46503); North Carolina DNRE (#659); Texas CEQ (#T104704495-12-2); Virginia DCLS (#1622); Wisconsin DNR (#999472650); USDA Soil Import Permit (#P330-09-00163).

Any qualification or narration of results, including sample acceptance requirements and test exceptions to the above referenced programs, is presented in the Statement of Data Qualifications section of this report. Estimates of analytical uncertainties and certification documents for the test results contained within this report are available upon request.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Jennifer L. Rice Project Chemist



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Lab Sample ID:

Client Sample ID: Disposal

Matrix:

**1208383-01** Water

Work Order:

1208383

Description: Sampled: Laboratory Services 08/21/12 10:30

Sampled By:

A.V.

Received:

08/22/12 10:30

## Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Barium	67	10	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Calcium	170	0.50	mg/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Cobalt	14	10	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Copper	170	10	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Iron	920	50	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Lead	<50	50	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Magnesium	34	0.50	mg/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210 <b>2</b> 94
Manganese	580	10	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	1210294
Selenium	38	5.0	ug/L	5	USEPA-6020A	08/30/12 17:00	CKD	<b>121</b> 0290
Sodium	16000	50	mg/L	100	USEPA-6010C	08/28/12 11:53	KLV	1210294
Zinc	51	20	ug/L	1	USEPA-6010C	08/28/12 12:28	KLV	<b>12</b> 10294



OCT 1 6 2012

HOMPROUND BANGERARE



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Disposal Lab Sample ID:

Matrix:

1208383-01 Water

Work Order:

1208383

Description:

Laboratory Services

Sampled:

08/21/12 10:30

Sampled By:

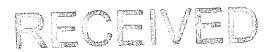
A.V.

Received:

08/22/12 10:30

## Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	150	20	mg/L	. 1	SM 2320 B 20th	08/29/12 13:01	SKA	1210512
Alkalinity, Carbonate	68	2.0	mg/L	1 .	SM 2320 B 20th	08/29/12 13:01	SKA	1210514
Alkalinity, Total	220	20	.∞ mg/L	1	SM 2320 B 20th	08/29/12 13:01	SKA	1210513
*Bromide	<300	300	mg/L	100	ASTM D 1246-95 (99)	08/23/12 16:21	KCS	1210313
Chloride	26000	500	mg/L	50 <b>0</b>	SM 4500-Cl E 20th	08/23/12 13:52	LMA	1210307
Conductivity @ 25° C	66240	5	umhos/cm	1	SM 2510 B 20th	08/23/12 17:56	KCS	1210315
<sup>/</sup> *pH	9.0	1.0	pH Units	1	SM 4500-H B 20th	08/23/12 10:44	SKA	1210247
*Oxidation/Reduction Potential	152	1	mV	1	ASTM D 1498-76	08/24/12 06:50	LMA	1210317
Sulfate	320	50	mg/L	10	ASTM D516-90 (02)	08/29/12 12:52	LMA	1210537
Residue, Dissolved @ 180° C	44900	2500	mg/L	1	SM 2540 C 20th	08/24/12 15:18	KCS	1210337
Specific Gravity	<b>1.0238</b>	0.7000	@ 60 °F	1	ASTM D 1429-79	08/31/12 17:53	HLB	1210655
Carbon, Total Organic	3.1	1.0	mg/L	1	SM 5310 C 20th	09/04/12 20:20	KAR	1210708
Sulfide, Total	3,8	1.0	mg/L	1	5M 4500-S2 F 20th	08/24/12 13:00	KAR	1210362



OCT 1 6 2012

LIC BRANCH EA. PROONS



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Lab Sample ID:

Client Sample ID: Recycle

Matrix:

1208383-02

Water

Work Order:

1208383

Description:

Laboratory Services

Sampled:

08/21/12 10:45

Sampled By:

A.V.

Received:

08/22/12 10:30

## Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
*Barium	200	50	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
Calcium	3700	250	mg/L	500	USEPA-6010C	08/28/12 11:57	KLV	1210294
*Cobalt	<50	50	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Copper	< 50	50	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Iron	950	250	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Lead	<250	250	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Magnesium	97	2.5	mg/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Manganese	140	50	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294
*Selenium	<100	100	ug/L	100	USEPA-6020A	08/30/12 17:12	CKD	1210290
Sodium	240000	1200	mg/L	2500	USEPA-6010C	08/28/12 12:04	KLV	1210294
*Zinc	<100	100	ug/L	5	USEPA-6010C	08/28/12 12:45	KLV	1210294



OCT 1 6 2012

UIC BRANCH EPA REGIONS

\*See Statement of Data Qualifications Page 4 of 10



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle Lab Sample ID:

Water

Matrix:

1208383~02

Work Order:

1208383

Description:

Laboratory Services

Sampled:

08/21/12 10:45

Sampled By:

A.V.

Received:

08/22/12 10:30

## Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	38	20	mg/L	1	SM 2320 B 20th	08/29/12 13:01	SKA	1210512
Alkalinity, Carbonate	<2.0	2.0	mg/L	1	SM 2320 B 20th	08/29/12 13:01	SKA	1210514
*Bromide	1100	600	mg/L	200	ASTM D 1246-95 (99)	08/23/12 16:21	KCS	1210313
Conductivity @ 25° C	219300	5	umhos/cm	1	SM 2510 B 20th	08/23/12 17:56	KCS	1210315
Specific Gravity	1.2180	0.7000	@ 60 °F	1	ASTM D 1429-79	08/31/12 17:53	HLB	1210655
Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	09/04/12 20:32	KAR	1210708
Alkalinity, Total	38	20	· mg/L	1	5M 2320 B 20th	08/29/12 13:01	SKA	1210513
*Oxidation/Reduction Potential	248	1	mV	1	ASTM D 1498-76	08/24/12 06:50	LMA	1210317
*рН	6,8	1.0	pH Units	1	SM 4500-H B 20th	08/23/12 10:44	SKA	1210247
Residue, Dissolved @ 180° C	329000	5000	mg/L	1	SM 2540 C 20th	08/24/12 15:18	KCS	1210337
Chloride	190000	5000	mg/L	5000	SM 4500-CI E 20th	08/23/12 12:54	LMA	1210307
Sulfate	2400	500	mg/L	100	ASTM D516-90 (02)	08/29/12 10:55	LMA	1210537
Sulfide, Total	3,6	1.0	mg/L	1	5M 4500-52 F 20th	08/24/12 13:00	KAR	1210362



## STATEMENT OF DATA QUALIFICATIONS

### Total Metals by EPA 6000/7000 Series Methods

Qualification: The RL for this analysis has been elevated due to sample matrix interference.

Analysis: USEPA-6010C

Sample/Analyte: 1208383-02

Recycle 1208383-02 Recycle 1208383-02 Recycle 1208383-02 Recycle 1208383-02 Recycle

1208383-02 Recycle 1208383-02 Recycle 1208383-02

Recycle

Barium

Cobalt Copper Iron Lead

Zinc

Magnesium Manganese

Analysis: USEPA-6020A

Sample/Analyte: 1208383-02

Recycle

Selenium



OCT 1 6 2012





## STATEMENT OF DATA QUALIFICATIONS

### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Qualification: The quality control batch(s), associated with the following samples and analyses, do not contain an

MS/MSD or MS/DUP because client specific matrix QC was not requested. An LCS and LCSD were

analyzed as the measure of batch precision and accuracy.

Analysis: ASTM D 1246-95 (99)

Sample/Analyte: 1208383-01

Disposal

Bromide

1208383-02 Recycle Bromide

Qualification: The referenced method requires analysis occur immediately after sample collection. Because

analysis was not performed in the field, the reported result must be considered estimated.

Analysis: ASTM D 1498-76

Sample/Analyte: 1208383-01

Disposal

Oxidation/Reduction Potential

1208383-02

Recycle

Oxidation/Reduction Potential

Analysis: SM 4500-H B 20th

Sample/Analyte: 1208383-01

Disposal

pН

1208383-02

Recycle

pΗ

Qualification: The following reported test methods and analyte(s) are exceptions to our NELAP Fields of Accreditation,

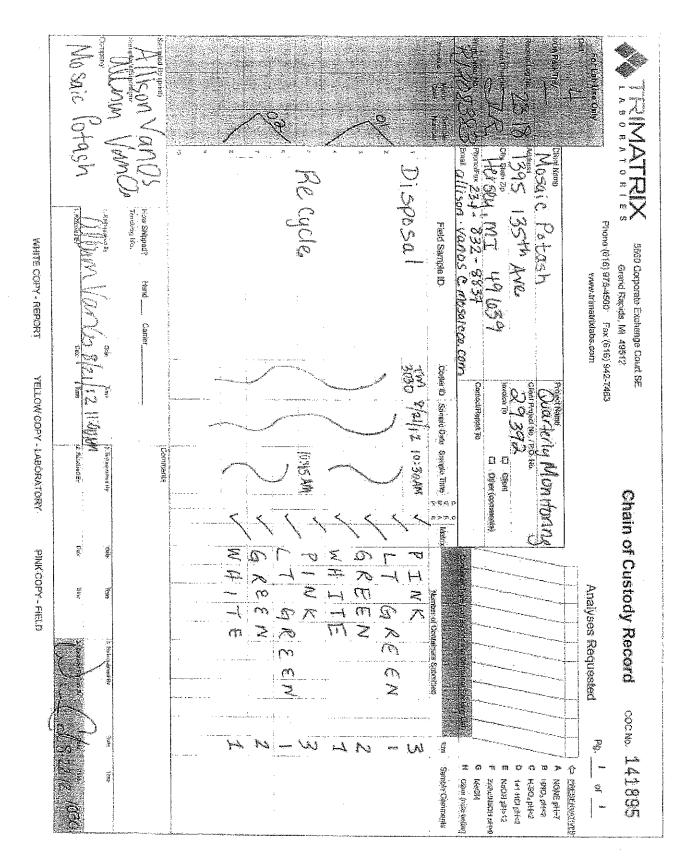
or for which accreditation is not required, applicable, or available.

Analysis: ASTM D 1429-79 Analyte(s): Specific Gravity

Analysis: ASTM D 1498-76

Analyte(s): Oxidation/Reduction Potential







SAMPLE RECEIVING / LOG-IN CHECKLIST Rendmiss sy (initiasysete) TR Gui (1202) See Artellional Cooler □ Bex Thermometer Used 🖸 Digital Treamometer (454) Information Force C Gree 〇 Other 撰 Time Couler # Coaler# Timbé Custosy Seas. шаюцу Бааб. Custody Spals: Curiouv Sees: None None ☐ None Th Mone □ None C Prosect / Intent CI Propert / Indah ☐ Present/Intest Present / Intact Present / Not Intact C Pressent / Not Intact Preside / Not tribad Present / Not release Codiani Location Doctari Locatine. Copiant Location: bolán: Localian: Dispersed / Top / Middle / Bottom Dispersed / Top / Next / Bostom Gazersed / Top / Middle / Boltom Dispersed / Top / Middle / Solsom Cockel/Teiripediture Taken Via: Coolant/Temporakus Takan Wa; Coolant/Temperatura Takan Via: Ceolantitemperature Taken Vicc Coss ke/Aug2d compros ☐ Leade-tob / Avg 9-5 containers O Loosa Intil Ava 2-3 conteners O lawere/Alg23 melaken: 🔲 Варрез Ба/Аууд-Дежиния Septed CS / Avg 2:22 and about C Fagged for Favy 23 months of s Diegged Ide / Avg 2-3 sonleiners C Som top / Avg 2-3 conservers Energian 2-2 continues D Blocker Average compression Till Stue toe / Avg 2-3 centiskeers Nose i Angi 2-3 cog sinous 🔯 Normal Aug 7 A compainments D None Lavo 2-5-containers Many Javy 2-3 agrisions elemate Femograture Takan Via: Ažamste Tempetature Takan Via: Memale Temperahite Takén Visi Morrana Temperature Taken Via: Comparature Black (TB) Temperature Blank (TB) Temperalma Blank (18) Temperatura Black (78) 1 Containar ☐ 1 Container i Container 🗀 🗆 Compress Correction Correction Correction Correction O\* belonged \*C Getuai 🕏 Reconled C Mduai°C Addust 10 Secondes °C Precorded "C ARROW TO Factor No Factor 10 Factor \*C Factor 10 Tarup Blank! Teimp Blink: Farie Stack: Lymp Stark: 1212 210 2113 19 Average \*C Average \*C Äverage Average \*C 20.7 Cooper ID Bir COC? ☐ Cooler ID on COC? CO Edoler la en COC? Coblet ID on COST ☐ VOC Trip Blank receivou? O VOC Trip Blank received? O VOC Top Blank reserved? ☐ VOC Trip Blank received? If <u>any</u> shaded areas checked, complete Sample Receiving Non-Conformance and/or inventory Form Paperwork Received Check Sample Preservation Yes: Chain of Custody record(s)? If No. Individed By Average sample temperature 36° 02 De la companya de la Received for Lab Signod/Date/Time? ☐ Was thermal preservation required? 🔲 នូវមិនទាំងថ្ម ៤៤០០៣ម៉ូនវិ If "No", Project Chemist Approval milals: Other\_ if "Veis" Completed Non Con Cooles - Cont Inventory Forms? Completed Sample Preservation Verification Form? COC-Information Samples chemically preserved somectly? 🗷 talwalakcoc 🗀 othe COC to Numbers: of "No", added brange tag? Received pre-preserved VOC soils? □ MeOH □ NaySQ Check COC for Accuracy Check for Short Hold-Time Prep/Analyses ☐ Pacretiplopical Analysis Requested? ☐ Air Nogs AFTER HOURS ONLY: Sample 15 matches COC?
Semple Bate and Trace matches CCC? COPIES OF COCTO LAB AREA(S) C EdCores / Mathecol Pre-Passerved Formeldetrydal Aldohyde D Navie Pedewed PRECEIVED GOOD TO LAB(S) Copialiser type completed on COC? Green-tagged circulators All container types inclicated are received? Yetowivehite-tagged til amberx (SV Přep-Lat) Sample Condition Summary Notes MA Na Brosen containeanida? Midsión er istomplete labels? Ulegroja Salognation on labels? Low votage race year? Trip Black recalized O Trip Bank not listed on COC Pageryork Delivered (Delet Lime) st Hour Goal 서설? Indepropriate or non-Trilivators containers received? Cooler Received (Date Time) U YOU wish / TOX contained have freedeparte? Yes & No Extra sample logations / containers set listed on COC

ung in Forms - Medalving Log-In\_Checkish

ravision: 3,4



#### SAMPLE PRESERVATION VERIFICATION FORM RIMATRIX page Client 901801Y Receipt Log-# Le 3.22.12 Project Chemis COC HD # Ph Strip Lot # Advising by DO NOT ADJUST ON FOR THESE CONTAINER TYPES HC137671 Dale Container Type 15 Tay Color եւ, Թաշ Blue Besteri Green Rod Food Single HNO3 Proservative Hach 11,50. $H_2SO_4$ Mone HMO<sub>N</sub> >12 <2 Expected phi <2 <2 6-8 <2 ODG Line #5 Aqueous Samples: For each sample and container type, 000 Lne #2 check the box if pH is (学家) 1.30年23 acceptable. If pH is not acceptable for any sample CO Clima #4 container, record pH in box, and note on Sample ă% enui Otio Receiving Checklist and on COC Line 48 Sample Receiving Non-Conformance Form If COC Lines?7 approved by Project Chemist, COO Line #8 add acid or base to the sample to achieve the correct 00% Une ## pH. Add up to, but do not exceed 2x the volume initially COO Line #10 added at container prep (see Comments table below tos initial volumes used). Addiorange pH tag-to sample container and record information requested. Record adjusted pH on this form. Do not adjust pH for COC ID# container types 3, 6, and 15. Adjusted by: DO NOT ADJUST OH FOR THESE CONTAINER TYPES Container Type É, 13 Ħ 15 LL Blue Tạn Color Blue Brown Green Red Red Ships Original Vol. of Container Size Preservativa NaOH 图透色. HASCI None HNC, HRO Preservative (ml.) (rol.) Expected of >12 <2 <2 <2 <2 COC Line # Container Type 5 NaOH COQLING #2 .500. ~.÷ COO Line và 1000 5.0 COUNTY # Comainer Type 4 HSO. 000111-53 125 D.S. COD Line #8 250 1.0 COC Line 47 SOO 2.5 COC Line #6 1000 4:0 C/30 Line #9 Container Type 13 H<sub>2</sub>SO<sub>1</sub> COC LINE #HO 500 23 Cogments

Page 10 of 10

Log in Forms - Sample\_Preserve\_Vortication

version 2.0



September 10, 2012



SEP 1 3 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604



Attn: Lisa Perenchio

RE: Class III Solution Mining Wells
Permit No. MI-133-3G-A002
Monthly Report for August 2012

During the month of August, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 11 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCl 1050 was in operation for 27 days this month.
- Cavity KCI 1060 was in operation for 17 days this month.
- Cavity KCl 2030 was in operation for 26 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 18 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCl 1010, KCl 1020, KCl 1040, KCl 1050, KCl 1060, KCl 2030, KCl 2040, KCl 2061, and KCl 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- 2. Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments

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## **CAVITY 1010**



## Cavity 1010

## **Daily Averages**

## UIOBRANCH

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return S Flow (gpm)
1-Aug-12	shut in	shut in	shut in
2-Aug-12	shut in	shut in	shut in
3-Aug-12	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in
15-Aug-12	shut in	shut in	shut in
16-Aug-12	shut in	shut in	shut in
17-Aug-12	shut in	shut in	shut in
18-Aug-12	shut in	shut in	shut in
19-Aug-12	shut in	shut in	shut in
20-Aug-12	shut in	shut in	shut in
21-Aug-12	shut in	shut in	shut in
22-Aug-12	shut in	shut in	shut in
23-Aug-12	shut in	shut in	shut in
24-Aug-12	shut in	shut in	shut in
25-Aug-12	shut in	shut in	shut in
26-Aug-12	shut in	shut in	shut in
27-Aug-12	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut in
31-Aug-12	shut in	shut in	shut in

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UIG BRANCH EPA, REGION 5

CAVITY 1020



## Cavity 1020

## Daily Averages

## UIC BRANCH EPA. REGION 5

		In I'		
	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Aug-12	shut in	shut in	shut in	
2-Aug-12	1130	136	155	
3-Aug-12	shut in	shut in	shut in	
4-Aug-12	shut in	shut in	shut in	
5-Aug-12	shut in	shut in	shut in	
6-Aug-12	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	
10-Aug-12	shut in	shut in	shut in	
11-Aug-12	shut in	shut in	shut in	
12-Aug-12	shut in	shut in	shut in	
13-Aug-12	shut in	shut in	shut in	
14-Aug-12	shut in	shut in	shut in	
15-Aug-12	shut in	shut in	shut in	
16-Aug-12	shut in	shut in	shut in	
17-Aug-12	shut in	shut in	shut in	
18-Aug-12	shut in	shut in	shut in	
19-Aug-12	shut in	shut in	shut in	
20-Aug-12	shut in	shut in	shut in	
21-Aug-12	shut in	shut in	shut in	
22-Aug-12	1171	227	253	
23-Aug-12	1141	212	259	
24-Aug-12	1136	35	41	
25-Aug-12	1098	106	138	
26-Aug-12	1165	207	235	
27-Aug-12	<b>√</b> 1177	183	230	
28-Aug-12	1118	241	320	
29-Aug-12	1025	<b>√</b> 262	298	
30-Aug-12	1074	239	268	
31-Aug-12	1098	230	272	



SEP 1 8 2012

Cavity 1020

UIC BRANCH EPA, REGION 5

Aug-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1121

189

224

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

27-Aug-12

1177

183

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

29-Aug-12

1025

262

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

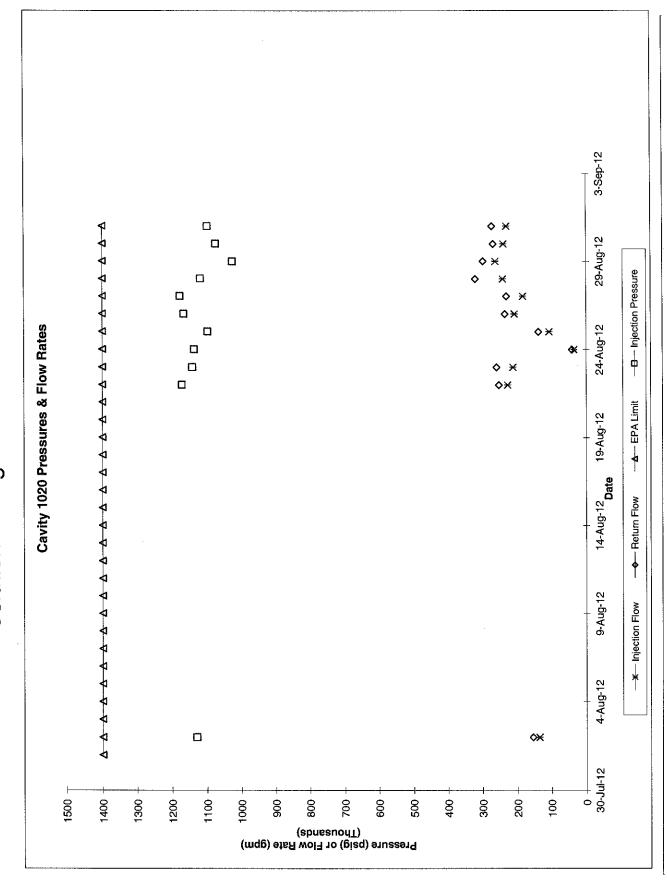
Injection Flow (gpm)

Injection Pressure (psi)

29-Aug-12

262

1025



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**CAVITY 1040** 



Cavity 1040

Daily Averages

## UIC BRANCH EPA, REGION 5

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Aug-12	shut in	shut in	shut in
2-Aug-12	shut in	shut in	shut in
3-Aug-12	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut ir
14-Aug-12	shut in	shut in	shut in
15-Aug-12	shut in	shut in	shut ir
16-Aug-12	shut in	shut in	shut ir
17-Aug-12	shut in	shut in	shut in
18-Aug-12	shut in	shut in	shut in
19-Aug-12	shut in	shut in	shut ir
20-Aug-12	shut in	shut in	shut in
21-Aug-12	shut in	shut in	shut in
22-Aug-12	shut in	shut in	shut in
23-Aug-12	shut in	shut in	shut in
24-Aug-12	shut in	shut in	shut it
25-Aug-12	shut in	shut in	shut in
26-Aug-12	shut in	shut in	shut in
27-Aug-12	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut it
31-Aug-12	shut in	shut in	shut i
	W.		

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CAVITY 1050 /



Cavity 1050

Daily Averages

UIC BRANCH

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Aug-12	1195	154	154
2-Aug-12	1153	160	160
3-Aug-12	1183	154	154
4-Aug-12	1188	169	169
5-Aug-12	1200	16	16
6-Aug-12	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in
10-Aug-12	1150	244	244
11-Aug-12	1200	156	156
12-Aug-12	1195	154	154
13-Aug-12	1177	181	181
14-Aug-12	1160	195	195
15-Aug-12	1187	180	180
16-Aug-12	1193	170	170
17-Aug-12	1187	201	201
18-Aug-12	1173	193	193
19-Aug-12	1117	181	181
20-Aug-12	1187	172	172
21-Aug-12	1200	165	165
22-Aug-12	1183	143	143
23-Aug-12	1200	138	138
24-Aug-12	1200	23	23
25-Aug-12	1200	80	80
26-Aug-12	1195	160	160
27-Aug-12	1188	175	175
28-Aug-12	1200	203	203
29-Aug-12	1200	168	168
30-Aug-12	1200	149	149
31-Aug-12	1173	154	154



Cavity 1050

Aug-12 Monthly Averages JIC BRANCH EPA, REGION 5

Injection Pressure (psi) 1185 Injection Flow (gpm)

157

Return Flow (gpm)

157

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

5-Aug-12

1200

16

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

19-Aug-12

1117

181

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

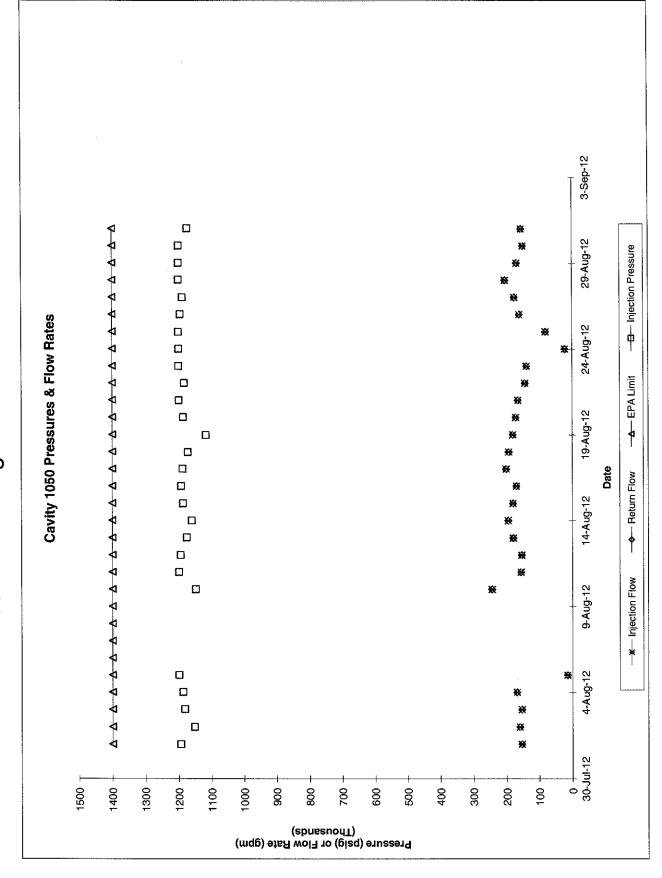
Injection Flow (gpm)

Injection Pressure (psi)

10-Aug-12

244

1150



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UIC BRANCH EPA, REGION 5

CAVITY 1060



Cavity 1060

Daily Averages

## UIC BRANCH

shut in

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return A, REGION & Flow (gpm)	3
1-Aug-12	1140	333	346	
2-Aug-12	1141	333	338	
3-Aug-12	1137	313	353	
4-Aug-12	1139	354	357	
5-Aug-12	1144	160	156	
6-Aug-12	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	
10-Aug-12	1058	146	360	
11-Aug-12	1114	271	288	
12-Aug-12	√ <b>1</b> 149	299	278	
13-Aug-12	1145	271	277	
14-Aug-12	1138	285	282	
15-Aug-12	1107	299	316	
16-Aug-12	1074	285	315	
17-Aug-12	1127	299	313	
18-Aug-12	1099	354	320	
19-Aug-12	1119	389	352	
20-Aug-12	1114	306	361	
21-Aug-12	1137	285	330	
22-Aug-12	shut in	shut in	shut in	
23-Aug-12	shut in	shut in	shut in	
24-Aug-12	shut in	shut in	shut in	
25-Aug-12	shut in	shut in	shut in	
26-Aug-12	shut in	shut in	shut in	
27-Aug-12	shut in	shut in	shut in	
28-Aug-12	shut in	shut in	shut in	
29-Aug-12	shut in	shut in	shut in	
30-Aug-12	shut in	shut in	shut in	

shut in

31-Aug-12

shut in



Cavity 1060

UIC BRANCH EPA, REGION 5

Aug-12 Monthly Averages

Injection Pressure 1122 Injection Flow 293 Return Flow 314

Maximum Injection Pressure and corresponding Injection Flow

Date 12-Aug-12 Injection Pressure 1149 Injection Flow

299

Minimum Injection Pressure and corresponding Injection Flow

Date 10-Aug-12 Injection Pressure 1058 Injection Flow

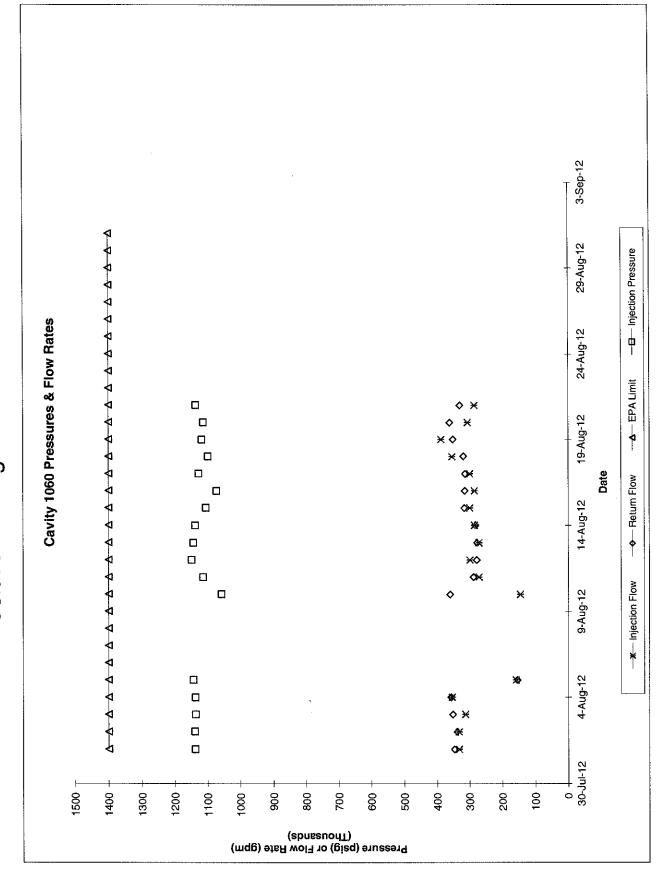
146

Maximum Injection Flow Rate and corresponding Injection Pressure

Date 19-Aug-12 Injection Flow 389

Injection Pressure

1119



## **CAVITY 2030**

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## Cavity 2030

SEP 1 3 2012

## **Daily Averages**

	Daily Averages		UIC BRANCH	
Date	Injection Pressure (psi)	Injection Flow (gpm)	Return A, REGION 5 Flow (gpm)	
1-Aug-12	1195	207	207	
2-Aug-12	1200	61	61	
3-Aug-12	shut in	shut in	shut in	
4-Aug-12	1188	245	245	
5-Aug-12	1200	121	121	
6-Aug-12	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	
10-Aug-12	1150	149	149	
11-Aug-12	1200	258	258	
12-Aug-12	1195	240	240	
13-Aug-12	1177	235	235	
14-Aug-12	1160	265	265	
15-Aug-12	1187	253	253	
16-Aug-12	1193	267	267	
17-Aug-12	1187	243	243	
18-Aug-12	1173	278	278	
19-Aug-12	1117	250	250	
20-Aug-12	1187	250	250	
21-Aug-12	1200	264	264	
22-Aug-12	1183	250	250	
23-Aug-12	1200	257	257	
24-Aug-12	1200	69	69	
25-Aug-12	1200	167	167	
26-Aug-12	1195	215	215	
27-Aug-12	1188	250	250	
28-Aug-12	1200	260	260	
29-Aug-12	1200	260	260	
30-Aug-12	1200	236	236	
31-Aug-12	1173	201	201	



SEP 1 3 2012

Cavity 2030

UIC BRANCH EPA, REGION 5

Aug-12 Monthly Averages

Injection Pressure (psi) 1186 Injection Flow (gpm)

221

Return Flow (gpm)

221

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Aug-12

1200

6

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

19-Aug-12

1117

250

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

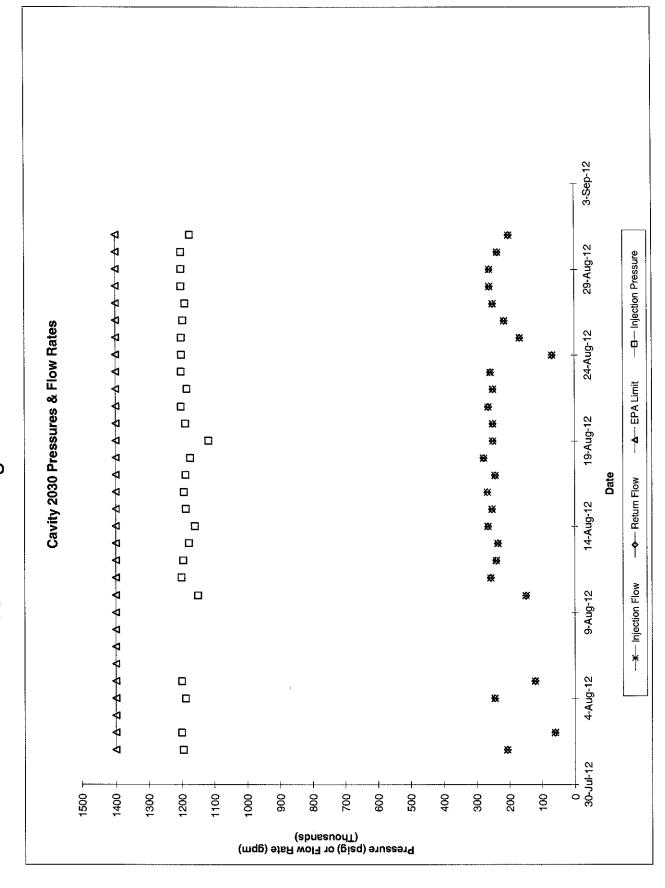
Injection Flow (gpm)

Injection Pressure (psi)

18-Aug-12

278

1173



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UIC BRANCH EPA, REGION 5

CAVITY 2040



SEP 1 3 2012

Cavity 2040

Daily Averages

# UIC BRANCH

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return PA, REGION Flow (gpm)
1-Aug-12	shut in	shut in	shut in
2-Aug-12	shut in	shut in	shut in
3-Aug-12	shut in	shut in	shut in
4-Aug-12	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in
11-Aug-12	shut in	shut in	shut in
12-Aug-12	shut in	shut in	shut in
13-Aug-12	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in
15-Aug-12	shut in	shut in	shut in
16-Aug-12	shut in	shut in	shut in
17-Aug-12	shut in	shut in	shut in
18-Aug-12	shut in	shut in	shut in
19-Aug-12	shut in	shut in	shut in
20-Aug-12	shut in	shut in	shut in
21-Aug-12	shut in	shut in	shut in
22-Aug-12	shut in	shut in	shut in
23-Aug-12	shut in	shut in	shut in
24-Aug-12	shut in	shut in	shut in
25-Aug-12	shut in	shut in	shut in
26-Aug-12	shut in	shut in	shut in
27-Aug-12	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut in
31-Aug-12	shut in	shut in	shut in

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SEP 1 3 2012

UIC BRANCH EPA, REGION 5

CAVITY 2061



SEP 1 3 2012

Cavity 2061

Daily Averages

# UIC BRANCH EPA, REGION 5

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Aug-12	1195	111	111
2-Aug-12	1153	94	94
3-Aug-12	1200	137	137
4-Aug-12	shut in	shut in	shut in
5-Aug-12	shut in	shut in	shut in
6-Aug-12	shut in	shut in	shut in
7-Aug-12	shut in	shut in	shut in
8-Aug-12	shut in	shut in	shut in
9-Aug-12	shut in	shut in	shut in
10-Aug-12	shut in	shut in	shut in
11-Aug-12	1200	66	66
12-Aug-12	1200	44	44
13-Aug-12	shut in	shut in	shut in
14-Aug-12	shut in	shut in	shut in
15-Aug-12	1190	36	36
16-Aug-12	1190	78	78
17-Aug-12	1180	99	99
18-Aug-12	1183	69	69
19-Aug-12	1117	163	163
20-Aug-12	1187	132	132
21-Aug-12	1200	61	61
22-Aug-12	1183	110	110
23-Aug-12	1200	102	102
24-Aug-12	1200	20	20
25-Aug-12	1200	47	47
26-Aug-12	1190	69	69
27-Aug-12	shut in	shut in	shut in
28-Aug-12	shut in	shut in	shut in
29-Aug-12	shut in	shut in	shut in
30-Aug-12	shut in	shut in	shut in
31-Aug-12	1173	89	89



SEP 1 3 2012

Cavity 2061

Aug-12 Monthly Averages UIC BRANCH EPA, REGION 5

Injection Pressure (psi)

1186

Injection Flow (gpm)

85

Return Flow (gpm)

85

Maximum Injection Pressure and corresponding Injection Flow

Date 3-Aug-12 Injection Pressure (psi)

Injection Flow (gpm)

1200

137

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

19-Aug-12

1117

163

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

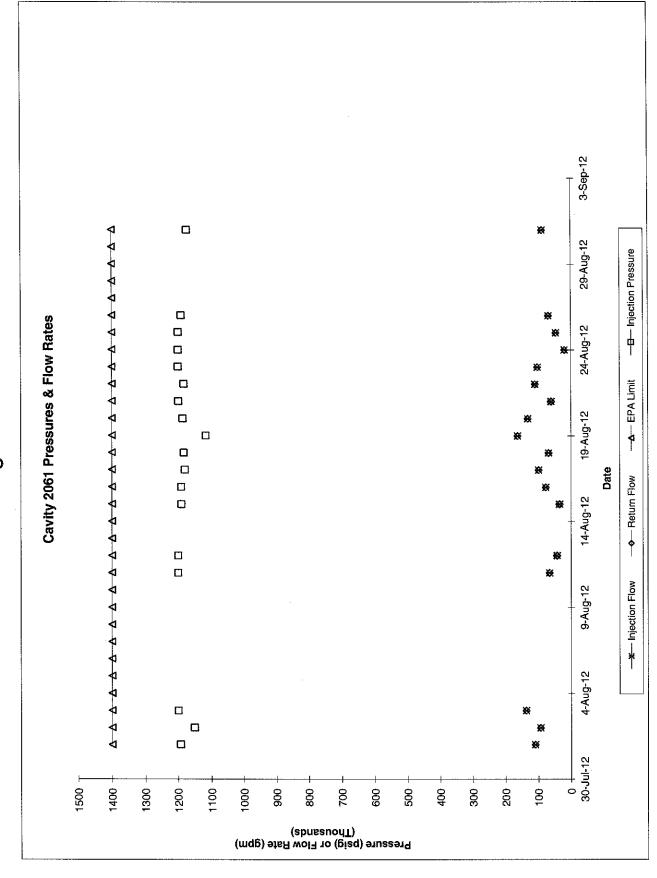
19-Aug-12

Injection Flow (psi)

Injection Pressure (psi)

163

1117



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UIC BRANCH EPA, REGION 5

CAVITY 2062



SEP 1 3 2012

Cavity 2062

Daily Averages

# UIC BRANCH EPA, REGION 5

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Aug-12	shut in	shut in	shut in	
2-Aug-12	shut in	shut in	shut in	
3-Aug-12	shut in	shut in	shut in	
4-Aug-12	shut in	shut in	shut in	
5-Aug-12	shut in	shut in	shut in	
6-Aug-12	shut in	shut in	shut in	
7-Aug-12	shut in	shut in	shut in	
8-Aug-12	shut in	shut in	shut in	
9-Aug-12	shut in	shut in	shut in	
10-Aug-12	shut in	shut in	shut in	
11-Aug-12	shut in	shut in	shut in	
12-Aug-12	shut in	shut in	shut in	
13-Aug-12	shut in	shut in	shut in	
14-Aug-12	shut in	shut in	shut in	
15-Aug-12	shut in	shut in	shut in	
16-Aug-12	shut in	shut in	shut in	
17-Aug-12	shut in	shut in	shut in	
18-Aug-12	shut in	shut in	shut in	
19-Aug-12	shut in	shut in	shut in	
20-Aug-12	shut in	shut in	shut in	
21-Aug-12	shut in	shut in	shut in	
22-Aug-12	shut in	shut in	shut in	
23-Aug-12	shut in	shut in	shut in	
24-Aug-12	shut in	shut in	shut in	
25-Aug-12	shut in	shut in	shut in	
26-Aug-12	shut in	shut in	shut in	
27-Aug-12	shut in	shut in	shut in	
28-Aug-12	shut in	shut in	shut in	
29-Aug-12	shut in	shut in	shut in	
30-Aug-12	shut in	shut in	shut in	
31-Aug-12	shut in	shut in	shut in	



Mosaic Potash Hersey LLC 1395 135<sup>th</sup> Avenue Hersey, MI 49639 www.mosaicco.com Tel 231-832-8800 Fax 231-832-3349

September 19th, 2012

Lisa Perenchio, Chief Underground Injection Control Branch United States Environmental Protection Agency 77 W. Jackson Blvd, WU-16J Chicago, IL 60604-3590

RE:

M-475 / MI-133-3G-A002

Part I MIT on Well KCL 1062



SEP 2 1 2012

UIC BRANCH EPA, REGION 5

The Part 1 Mechanical Integrity Test was passed for Well 1062 on September 7<sup>th</sup>, 2012. The EPA did not witness the test per instructions from Jeff McDonald of USEPA. No representative from the Michigan Department of Environmental Quality was present to witness the test. The DEQ Annular Pressure Test form completed by authorized on-site personnel is enclosed. The USEPA Standard Annular Pressure Test form for an un-witnessed test is enclosed, along with the calibration certification for the pressure gauge that was used.

If you need additional information, please contact me at 231-832-8824 or douglas.patulski@mosaicco.com.

Sincerely,

Douglas M. Patulski

Minefield Superintendent

Mosaic Potash Hersey

Cc: Raymond Vugrinovich, Michigan Department of Environmental Quality

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

## STANDARD ANNULAR PRESSURE TEST

Operator MOSAIC POTASH HERSEY	State Permit No. M-475
Address 1395 135 T# AUE	USEPA Permit No. MT -133 -36- ADOZ
HERSEY MI 49639	Date of Test <u>69/07/12</u>
Well Name MOSAIC 1062	Well Type
LOCATION INFORMATION NE	Quarter of the SE Quarter of the NE Quarter
Section 26; Range 09W	; Township 17 N; County OSCEOLA;
Company Representative Bill Licks	; Field Inspector None;
Type of Pressure Gauge Dated inch face;	0-3000 psi full scale; 0.0000 psi increments;
New Gauge? Yes ~ No~ If	no, date of calibration $6/26/2012$
Calibration certification submitted?	Yes ~ No ~
TEST RESULTS	5-year or annual test on time? Yes ~ No ~
	After rework? Yes ~ No ~
	Newly permitted well? Yes ~ No ~
Pressure (in psig)	
Time Annulus Tubi	ng cu ==#
11:45 961.0764 No	Casing size 7"-23"
11:50 960.0512	Tubing size Nows
11:55 959.0126	Packer type BRIDGE PLUG
12:00 957.9124	Packer set @ 6/5/
12:05 956.8012	
12:10 955.6924	Fluid return (gal.) W/A
12:15 954.3816	Comments:
1	
WM OKalzille	
Test Pressures: / Max. Allowable Pressure C	Change: Initial test pressure x .03
	Half Hour Pressure change6.694psi
Test Passed ~ Test Failed ~	
If failed test, well must shut in, no injection can o	ccur, and USEPA must be contacted within 24 hours.
Corrective action needs to occur, the well retested	l, and written authorization received before injection can
recommence.	
hin deil	nglan han
Signature of Company Representative	Date

UNWITNESSED MECHANICAL INTEGRITY TEST FORM



## MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY - OFFICE OF GEOLOGICAL SURVEY

ANNULAR PRESSURE TEST

			Permit Number M-475				<del></del>
	authority of Part 615 or Part Act 451 PA 1994, as amend		Well name & No.			·	
Non-submis	act 451 PA 1994, as amend ssion and/or falsification of t result in fines and/or impris	this information	Mosaic 1062		- <del></del>		
			Surface location NE 1/4 of SE	1/4 of <b>NE</b> 1	/4, Section <b>26</b>	⊤ 1 <b>7N</b>	R <b>09W</b>
Name and address o	•		Township Hersey		County Osceola		
Mosaic Potash He 1395 135 <sup>th</sup> Ave	ersey				Well type		
1395 135" Ave Hersey, Mi 49639			Dort Car	_	overy 🔲 Brine	dia===='	
, 10130y, HII 43033			Part 615			•	
			Part 625	Waste disposa	al 🛛 Solut	ion minini	g
	•						
			0		Tubing		
Date of test 09/07/2012			Casing <b>7" 23#</b>		Tubing None		
Type of gauge	Digital		Packer type/mod Retrievable Br		Packer depth 6151'		
inch face	psi range <b>0-3000#</b>						
~ ~	∕es ⊠ No		Type of non-corre				
if no, enter date of te		6/26/2012	liquid in the annu				
Average rate during 300 G.P.M.	injection		Maximum allower	a injection press	sure		
		TES <sup>1</sup>	T DATA				
			eadings (psig)				
Time	Annulus	tubing	Time	Ar	nulus		tubing
11:45	961.0764						
11:50	960.0512					***	
11:55	959.0126						
12:00	957.9124						
12:05	956.8012						
12:10	955.6924						
12:15	954.3816	1000					
·							
		Lung-					
			-			<del></del>	
						-	
		<u></u>			·		
					<del></del>		
Campaga							
Comments							
Set Bridge Plug	@ 6151' . Complete un	witnessed MIT. Will com	plete part 2 MIT I	Monday Septe	ember 10 <sup>th</sup> and	send r	esults.
antista t							
Certification if witne	essed by DEQ representative	/e:			·		
Signature of DEQ	emplovee			Date			
· .		tative: "I state that I am autho	rized by said sums-		e prepared unde	my ound	urvision and
direction. The fact	wiinessed by DEQ represer s stated herein a∕e true. aci	itative; "I state that I am autho curate and complete to the be	nzed by said owner. st of my knowledge.	, нвы тероп wa	s prepared under	my supe	arvisium allu
	0. 11.11	F	<b>.</b>		1 /	•	
Signature	Dell Heills			Date	09/07/2	012	
	All TO: OFFICE OF CE	N OCICAL SUDVEY			<del></del>		

MAIL TO: OFFICE OF GEOLOGICAL SURVEY
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

4500 148th Avenue N. E. Redmond, WA 98052-5194 Telephone: (425) 883-8700

Facsimile: (425) 867-5407 Email: support@paroscientific.com Internet:http://www.paroscientific.com

## CERTIFICATE OF CONFORMANCE

CUSTOMER:	MOSAIC POTASH HERSEY		
PURCHASE ORDER:	CHARGE		
DIGIQUARTZ MODEL:	765-3K		
PART NUMBER:	1100-019-0		
SERIAL NUMBER(S):	105210		

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The Digiquartz model(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure, temperature standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001:2008.

Nance Schulman AUTHORIZED SIGNATURE

6/26/12 DATE

Warren Schuchman, Quality Assurance Manager

Technology

Precision Pressure Instrumentation

Document no. T8148, Rev "AU", 11 Oct 2011 page 1 of 2

4500 148th Avenue N. E. Redmond, WA 98052-5194

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# CERTIFICATION OF TRACEABILITY TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Primary pressure and temperature standards used in the calibration and testing of Paroscientific Digiquartz Models have traceability to the National Institute of Standards and Technology through the following documentation.

#### Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 15441 and 16653 traceable to NIST. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, 16654 and 1284473284 traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 14576, 16603, 31227, 39628, 68390 and 1317389777 traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 14575, 16602, 31226, 39627, 68389 and 1317739617 traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170 and 1284475131 traceable to NIST. Piston/Cylinder P/N 6-201, No. P1-949/C1-922, via DH Instruments Calibration Report 17176 and 17445, traceable to NIST.

#### DH Primary Pressure Standard, Oil Operated Gauge:

DH Instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate Report No. 8398, 22146, 32354, 45306, 66563 and 1305698573 traceable to NIST. Piston/Cylinder 3511 via DH Calibration Report No. 8399, 22147, 32353, 45307, 66562 and 1305625084 traceable to NIST. Mass Set S/N 2032 via DH Calibration Report No. 24809, 24826, 45305, 45308, 1305538925 and 1305530461 traceable to NIST.

#### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 8541, 27161, 38275 and 1300177141 traceable to NIST. Mass Set S/N 2032/3293 via DH Calibration Certificate Nos.4630, 24809, 8540, 32142, 45305 and 1300200369 traceable to NIST.

#### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601 via DH Instruments Calibration No. 32162, 41492 and 69127 traceable to NIST. Piston/Cylinder S/N 305 via DH Instruments Calibration No. 20281, 32161, 41490 and 69125 traceable to NIST. DH Instruments 35 kg Mass Set No. 2052 and Bell No. 261A via DH Instruments Calibration Report No. 20282, 32163, 32164, 41491, 41493, 69126 and 69124 traceable to NIST.

#### Hygroclip S3 MET4/4A Part number 1560-XXX and 1561-XXX:

Humidity and Temperature calibrations are traceable to NIST through Rotronic Instrument Corporation; 160 E. Main Street, Huntington, NY 11743.

#### Hygroclip HC2-S3 MET4/4A Part number 1563-XXX and 1564-XXX Swiss Calibration Service (SCS)

Humidity and Temperature calibrations are traceable to SCS through Rotronic AG Grindelstrasse 6 8303 Bassersdorf Phone: O44-838-1111 E-mail: info@rotronic.ch

Technology

Precision Pressure Instrumentation

Document no. T8148, Rev "AU", 11 Oct 2011 page 2 of 2

An ISO9001:2008 registered company

4500 148th Avenue N. E. Facsimile: (425) 867-5407 Redmond, WA 98052-5194 Email:support@paroscientific.com Telephone: (425) 883-8700 Internet:http://www.paroscientific.com

### CERTIFICATE OF CALIBRATION

DIGIQUARTZ MODEL: 765-3K SERIAL NUMBER(S): 105210

The Paroscientific Digiquartz Model (s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology.

Piston/Cylinder: 6-001-0002, P2-919/C2-1523, Weight Set 1: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading  Piston/Cylinder: 6-001-0002, P2-652/C2-1378, Weight Set 2: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading	er: 6-201-0001,	S/N 4034 and S/N 1014  Piston/Cylinder: 6-001-0001, P1-949/C1-922, Weight Set 2: 6-002-0002  Range: 0.3 to 5 psi [2 to 34 kPa]  Accuracy: 0.015 percent of reading
Weight Set 1: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading  Piston/Cylinder: 6-001-0002, P2-652/C2-1378, Weight Set 2: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa]		2: 6-002-0002 Range: 0.3 to 5 psi [2 to 34 kPa]
Weight Set 2: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa]		
ary Pressure Standard		3
tic Absolute or Gauge Dead Weight Tester Part Number	er. PG7601 S/N	161
Piston/Cylinder: S/N 305, Mass Set: S/N 2052 Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, Accuracy: 0.002 percent of reading	0.29 to 50 psi [	2 to 345 kPa) gauge mode
ary Pressure Standard		
tic Gauge Dead Weight Tester, Model 5203, S/N 5557	,	
Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S Range: 20 to 1,600 psi [0.14 to 11 MPa] Accuracy: 0.005 percent of reading	/N 3293	
pary Pressure Standard		
<del></del>	<b>0</b> 5	
, ,	•	
		(PARO) TEST
	Piston/Cylinder: S/N 305, Mass Set: S/N 2052 Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, Accuracy: 0.002 percent of reading  mary Pressure Standard  tic Gauge Dead Weight Tester, Model 5203, S/N 5557  Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S Range: 20 to 1,600 psi [0.14 to 11 MPa] Accuracy: 0.005 percent of reading  mary Pressure Standard  rated Gauge Dead Weight Tester, Model 5306, S/N 35  Piston/Cylinder: S/N 3375, Mass Set: S/N 2032 Range: 40 to 20,000 psi [0.3 to 138 MPa] Accuracy: 0.01 percent of reading above 200 psi [1 or 0.02 psi [0.14 kPa] at lower pressure Piston/Cylinder: S/N 3511, Mass Set: S/N 2032 Range: 145 to 72,500 psi [1 to 500 MPa] Accuracy: 0.02 percent of reading above 725 psi [5]	Piston/Cylinder: S/N 305, Mass Set: S/N 2052 Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0.29 to 50 psi [5 Accuracy: 0.002 percent of reading  hary Pressure Standard  ttic Gauge Dead Weight Tester, Model 5203, S/N 5557  Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N 3293 Range: 20 to 1,600 psi [0.14 to 11 MPa] Accuracy: 0.005 percent of reading  hary Pressure Standard  rated Gauge Dead Weight Tester, Model 5306, S/N 3505  Piston/Cylinder: S/N 3375, Mass Set: S/N 2032 Range: 40 to 20,000 psi [0.3 to 138 MPa] Accuracy: 0.01 percent of reading above 200 psi [1.4 MPa]  or 0.02 psi [0.14 kPa] at lower pressure

Digiquartz® Pressure Instrumentation

Document No. 8145-001, Rev. P 9/22/10

## Paroscientific, Inc. Pressure Instrument Configuration

**SN: 105210** Part Number: 1100-019-0 Model: 765-3K

Port: Oil Filled

Calibration Date: 26-Jun-12 Report No: 14293

Technician: RM

Pressure Range: 0 to 3000 psia

Temperature Range: 0 to 40 deg C

Customer: Mosaic Potash Hersey

Report Date: 26-Jun-12

Address: 1395 135th Avenue

Sales Order: 30096

Hersey, MI 49639 USA

S/R Number : 10251

Configuration	Calibration Coefficients
BL: 0 PT: N  BR: 9600 QD: -  DD: - QO: -  DL: 0 SL: -  DM: 0 SN: 105210  DO: - ST: -  DP: 6 SU: 0  ID: 07 TI: 4670  IM: - TR: 952  LL: - TU: 0  LH: - UF: 1.000000  MC: Y UL:  MD: 1 UM: USER  MN: 765-3K UN: 1  OP: - US: 0  PF: 3000.000 VR: P1.06  PI: 4670 ZI: 0  PL: 3600.000 ZS: 0  PO: 0 ZL: 0  PR: 238 ZV: .0000000  AU: 3000.000  GD: 0  GT: 0  LW: 0  PC: .9999510  PX: 5  RS: 1  RU: -	U0: 5.813680 µsec Y1: -3958.154 deg C / µsec Y2: -13865.89 deg C / µsec² Y3: -138805.8 deg C / µsec³ C1: -14414.57 psi C2: -99.30154 psi / µsec C3: 48299.55 psi / µsec² D1: 0.0446906 D2: 0.0000000 T1: 30.00206 µsec T2: 0.820646 µsec / µsec² T4: 71.54495 µsec / µsec² T5: 2095.804 µsec / µsec⁴ TC: 0.6781528 PA: -0.3538370 PM: 0.9999510

Paroscientific, Inc.

4500 148th Ave. N.E. Redmond, WA 98052 Phone: (425)883-8700 Fax: (425)867-5407

Web:http://www.paroscientific.com Email: support@paroscientific.com Prepared by





Technology



Mosaic Potash Hersey LLC 1395 135<sup>th</sup> Avenue Hersey, MI 49639 www.mosaicco.com

Tel 231-832-8800 Fax 231-832-3349



JAN 0 2 2013

December 28th, 2012

Lisa Perenchio, Chief Underground Injection Control Branch United States Environmental Protection Agency 77 W. Jackson Blvd, WU-16J Chicago, IL 60604-3590 UIC BRANCH EPA, REGION 5

RE:

Permit No. MI-133-3G-A002 / M448 (M469) and M449

Part I MIT on Wells 2041 and 2042

The Part 1 Mechanical Integrity Tests were passed for Wells 2041 (2041A) and 2042 on December 21<sup>st</sup> and December 14<sup>th</sup>, 2012, respectively. The EPA did not witness the test per instructions from Jeff McDonald of USEPA. Mr. Stafford Dusenbury of the Michigan Department of Environmental Quality was present to witness the tests. The DEQ Annular Pressure Test forms completed by Mr. Dusenbury are enclosed. The USEPA Standard Annular Pressure Test forms for an un-witnessed test are enclosed, along with the calibration certification for the pressure gauge that was used.

If you need additional information, please contact me at 231-832-8824 or douglas.patulski@mosaicco.com.

Sincerely.

Douglas M. Patulski Minefield Superintendent

Mosaic Potash Hersey

Cc: Raymond Vugrinovich, Michigan Department of Environmental Quality

	QUALITY - OFFICE OF GEOLOGICAL SURVEY
ANNULAR PR	ESSURE TEST
By authority of Part 615 or Part 625 of	Permit Number M469 /MI-133-3G-A002
Act 451 PA 1994, as amended.  Non-submission and/or falsification of this information	Well name & No. IMC Potash Hersey No. 2041A
may result in fines and/or imprisonment.	Surface location SE 1/4 of NW 1/4 of SW 1/4, Section 26 T 17N R 09W
Name and address of permittee	Township County
Mosaic Potash Hersey	Hersey Osceola
1395 135th Avenue	
Hersey, MI 49639	Well type
10-979 Maria Maria	Part 615 Secondary recovery Brine disposal
	Part 625 Waste disposal Solution mining
Date of test	Casing Tubing
12-21-12	7", 23#, L-80 7734 feet
Type of gauge	Packer type/model Packer depth
	development martine 6920
inch face psi range	
New gauge Yes No Digithrott Portable If no, enter date of test calibration	Type of non-corrosive
Average rate during injection	liquid in the annulus  Maximum allowed injection pressure
Average rate during injection	Waximum anowed injection proceeds
TEC	F DATA
	FDATA  eadings (psig)
Time Annulus tubing	Time Annulus tubing
1255 1042.67 1040	Tailo tailo
100 PM 1042, 61 1040	
105 1042, 49 1040	Party Miles
110 1042.40 1040	
115 1042-32 1040	
170 1042.20 1040	A A AA47
125 1042.10 1040	JAN 0 % 2013
	HIC BRANCH
	UIO DIMITUI
	EPA, REGION 5
X2	
Comments	
S. Fr	m mill 7020-7030
Certification if witnessed by DEQ representative:	
Signature of DEQ employee Staffan William	Date 12-21-12
Certification if not witnessed by DEQ representative: "I state that I am Jutho direction. The facts stated herein are true, accurate and complete to the be	rized by said owner. This report was prepared under my supervision and
direction. The lacts stated herein are the, according and complete to the be	
Signatura Dew All	Date /2-21-12
Signature / / / / / /	Date Date

MAIL TO:

OFFICE OF GEOLOGICAL SURVEY
MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
PO BOX 30256

EQP 7606 (rev. 8/2004)

LANSING MI 48909-7756

## ANNULAR PRESSURE TEST

Du authority of Dart CdF are Dart CGF af	Permit Number M449 /MI-133-3G-A002
By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information	Well name & No. IMC Potash Hersey No. 2042
may result in fines and/or imprisonment.	Surface location SE 1/4 of NW 1/4 of SW 1/4, Section 26 T 17N R 09W
Name and address of permittee  Mosaic Potash Hersey	Township County Hersey Osceola
1395 135th Avenue	Well type
Hersey, MI 49639	Part 615 Secondary recovery Brine disposal
	Part 625
Date of test 12-14-12	Casing 7", 23#, L-80 7797 feet Tubing 4½" 11.6#
Type of gauge Digiquatt 2 Portable Standard inch face psi range Model 765	Packer type/model Packer depth  Development Mandril 6865
inch face psi range Nociet 165  New gauge ☐ Yes ☐ No Reconditional June 2012	Type of non-corrosive satural brine is water
if no, enter date of test calibration	iidaid iii die aliifalds
Average rate during injection intell shut in.	Maximum allowed injection pressure
TEST	DATA
	eadings (psig)
Time Annulus tubing 145 1074.26 1050	Time Annulus tubing
150 1023.94 1050	
155 1023.58 1050	
200 /023.38 /050 205 /023.78 /050	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
210 j023.00 /050 215 j022.82 j050	
215 /022.82 /050	
	JAN <b>0 2</b> 2013
	8 8 8 480
	+ UIC BRANCH
	EPA REGIONS
Comments Section milked at 6965	
Annulus bled after test	Fluid potent to all-
	Troga relain to leaser
Certification if witnessed by DEQ representative:	
Signature of DEQ employee Haffan V Wisenskry	
Certification if not witnessed by DEQ representative: "I state that I am author direction. The facts stated herein age true, accurate and complete to the be	est of my knowledge."
1 1 1 1	17/11/.
Signature / Sul Auto	Date 14/4//>
MAIL TO: OFFICE OF GEOLOGICAL SURVEY MICHIGAN DEPARTMENT OF ENVIRONMEN	NTAL QUALITY

EQP 7606 (rev. 8/2004)

PO BOX 30256 LANSING MI 48909-7756

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

## STANDARD ANNULAR PRESSURE TEST

Operator Mosasc	POTASH HERSE	<u> </u>	State Permit No. 11-448 (H-46
Address <b>1395</b> /	35 TH AVE		USEPA Permit No. MT-133-36-A002
HERSEY,	MI 49639		Date of Test
	AIC 2041 (2	041 A)	Well Type
LOCATION INFOR	MATION	Quarter of	the <u>NW</u> Quarter of the <u>SW</u> Quarter
Section 26	; Range	<i>9 W</i> ; Town	ship /7 N; County OSCEOLA;
	ative Bru Hec	<b>5</b> ;	Field Inspector <u>574FF0RD DUSENBURY (MOER)</u>
Type of Pressure Ga	uge Pano action ric in	reh fåce; <i>300</i>	psi full scale; <u>o.ooo</u> psi increments;
	No. 10 Percentage Control of the Con		f calibration 6/24/12
Calib	ration certification su	bmitted? Yes	No ~
TEST RESULTS		erani) menan	5-year or annual test on time? (Yes)~ No ~
. 👸 💃			After rework? Yes ~ No ~
		ing.	Newly permitted well? Yes ~ No ~
	Pressure (ir	n psig)	
Time	Annulus	Tubing	7.4
12:65	1042.67	1040	Casing size 7"
13:00	1042.61	1040	Tubing size 4/2
/3:05	1042.49	1040	Packer type None
13:10	1042.40	1040	Packer set @ NONE
13:15	1042.32	1040	,
13:20	1042.20	1040	Fluid return (gal.) NA
13:25	1042.10	1040	Comments:
			TESTED AGRINST FORMATION
			7020
Test Pressures:	Max. Allowable P	ressure Change: In	nitial test pressure x .03
		H	Ialf Hour Pressure change
	st Failed ~		; 
	· ·		USEPA must be contacted within 24 hours.
	eeds to occur, the wel	I retested, and wri	tten authorization received before injection can
recommence.	. ,		
Due Hus	4		12/21/12
Signature of	f Company Represent	ative	Date

UNWITNESSED MECHANICAL INTEGRITY TEST FORM

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY STANDARD ANNULAR PRESSURE TEST

Operator Mosaic	POTASH		State Permit No	- 449
Address /395	35th AUE		USEPA Permit No. 1	NI-133-36-A00Z
•	MI 49639		Date of Test /2-/	14-12
Well Name MOSAL			Well Type	
LOCATION INFOR		Quarter of t	heQuarter of the	e 5W Quarter
of Section 26	; Range <u>09</u>	™; Towns	hip <u>/7 //</u> ; County _	OSCEOLA;
1000			ield Inspector <i>Stafford Dusa</i>	
Type of Pressure Ga			psi full scale; O.OONO	
New Gauge? Yes □	No If no, date of ca	libration <u>6/24/12</u>	Calibration certification sub	omitted? Yes ⊠No □
TEST RESULTS	10	too for a	5-year or annual test o	n time? Yes 🏿 No □
	ken at least every 10 mi utes for Class II, III and		2-year test for TA'd wells o	n time? Yes □ No □
minutes for Class I	vells.		After 1	ework? Yes □ No □
For Class II wells, a nsig. For Class I we	nnulus pressue should b Ils, annulus pressure sh	ould be the	Newly permitte	ed well? Yes □ No □
greater of 300 psig	or 100 psi above maxim	um permitted		
injection pressure.	dings must be submitted	I with this form.		
·				
Time	<u>Pressure (in p</u> Annulus	o <u>sig)</u> Tubing	Casing size	28 <sup>#</sup>
13:45	1024.26	1050	Tubing size 4/2"	11.6#
13:50	1023.94		Packer type Now E	
<u>13:55</u>	<u> 1023.58</u> _		Packer set @ None	-TESTED Against townst.
14:00	<u> 1023, 38                                   </u>		Top of Permitted Injection Is packer 100 ft or less	
14:05	1023. (8		*	~
14:10	1023:00		Injection Zone? Yes	
14:15	1022.82		If not, please submit a	justification.
			Fluid return (gal.)/ Comments:	
Test Pressures:	Max. Allowable Pres	ssure Change: Ini Te	tial test pressure x 0.03 st Period Pressure change	<i>30.7278</i> psi / <i>44</i> psi
Test Passed	Test Failed □			
If failed test, well n Corrective action n recommence.	nust be shut in, no injec eeds to occur, the well r	tion can occur, ar etested, and writt	nd USEPA must be contacted ten authorization received bef	within 24 hours. Ore injection can
belief, true, accurat	e, and complete. I am a	aware that there a	chments are, to the best of my re significant penalties for sul tent for knowing violations.	bmitting false
1 1		/ / N		
Dil Wick	V/S	Due Ku	Ls.	12-18-12
Printed Name of C	ompany Representative	Signature of C	ompany Representative	Date

4500 148th Avenue N. E.

Facsimile: (425) 867-5407 Redmond, WA 98052-5194 Email: support@paroscientific.com Telephone: (425) 883-8700 Internet: http://www.paroscientific.com

## CERTIFICATE OF CONFORMANCE

CUSTOMER:	MOSAIC POTASH HERSEY			
		·		
PURCHASE ORDER:	CHARGE			
DIGIQUARTZ MODEL:	765-3K			
PART NUMBER:	1100-019-0			
SERIAL NUMBER(S):	105210			

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The Digiquartz model(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure, temperature standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001:2008.

Maner Schulman

6/26/12

**AUTHORIZED SIGNATURE** 

DATE

Warren Schuchman, Quality Assurance Manager

Technology

Precision Pressure Instrumentation Document no. T8148, Rev "AU", 11 Oct 2011 page 1 of 2

4500 148th Avenue N. E. Redmond, WA 98052-5194 Telephone: (425) 883-8700

Facsimile: (425) 867-5407

Email: support@paroscientific.com Internet:http://www.paroscientific.com

# CERTIFICATION OF TRACEABILITY TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Primary pressure and temperature standards used in the calibration and testing of Paroscientific Digiquartz Models have traceability to the National Institute of Standards and Technology through the following documentation.

#### Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 15441 and 16653 traceable to NIST. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, 16654 and 1284473284 traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 14576, 16603, 31227, 39628, 68390 and 1317389777 traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 14575, 16602, 31226, 39627, 68389 and 1317739617 traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170 and 1284475131 traceable to NIST. Piston/Cylinder P/N 6-201, No. P1-949/C1-922, via DH Instruments Calibration Report 17176 and 17445, traceable to NIST.

#### DH Primary Pressure Standard, Oil Operated Gauge:

DH Instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate Report No. 8398, 22146, 32354, 45306, 66563 and 1305698573 traceable to NIST. Piston/Cylinder 3511 via DH Calibration Report No. 8399, 22147, 32353, 45307, 66562 and 1305625084 traceable to NIST. Mass Set S/N 2032 via DH Calibration Report No. 24809, 24826, 45305, 45308, 1305538925 and 1305530461 traceable to NIST.

#### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 8541, 27161, 38275 and 1300177141 traceable to NIST. Mass Set S/N 2032/3293 via DH Calibration Certificate Nos.4630, 24809, 8540, 32142, 45305 and 1300200369 traceable to NIST.

### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601 via DH Instruments Calibration No. 32162, 41492 and 69127 traceable to NIST. Piston/Cylinder S/N 305 via DH Instruments Calibration No. 20281, 32161, 41490 and 69125 traceable to NIST. DH Instruments 35 kg Mass Set No. 2052 and Bell No. 261A via DH Instruments Calibration Report No. 20282, 32163, 32164, 41491, 41493, 69126 and 69124 traceable to NIST.

#### Hygroclip S3 MET4/4A Part number 1560-XXX and 1561-XXX:

Humidity and Temperature calibrations are traceable to NIST through Rotronic Instrument Corporation; 160 E. Main Street, Huntington, NY 11743.

### Hygroclip HC2-S3 MET4/4A Part number 1563-XXX and 1564-XXX Swiss Calibration Service (SCS)

Humidity and Temperature calibrations are traceable to SCS through Rotronic AG Grindelstrasse 6 8303 Bassersdorf Phone; O44-838-11 11 E-mail info@rotronic.ch

Precision Pressure Instrumentation

Document no. T8148, Rev "AU", 11 Oct 2011 page 2 of 2

An ISO9001:2008 registered company

4500 148th Avenue N. E. Facsimile: (425) 867-5407 Redmond, WA 98052-5194 Email:support@paroscientific.com Telephone: (425) 883-8700 Internet:http://www.paroscientific.com

## CERTIFICATE OF CALIBRATION

DIGIQUARTZ MODEL: 765-3K SERIAL NUMBER(S): 105210

	oscientific Digiquartz Model (s) identified above has been ds. All have traceability to the National Institute of Standa			ressure
3eli and	Howell Primary Pressure Standard			
<sup>2</sup> neuma	ttic Absolute or Gauge Dead Weight Tester Part Number	: 6-201-0001,	S/N 4034 and S/N 1014	
	Piston/Cylinder: 6-001-0002, P2-919/C2-1523, Weight Set 1: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa]		Piston/Cylinder: 6-001-0001, P1-949/C1-922, V 2: 6-002-0002 Range: 0.3 to 5 psi [2 to 34 kPa]	Veight Sei
	Accuracy: 0.010 percent of reading		Accuracy: 0.015 percent of reading	
<b>X</b>	Piston/Cylinder: 6-001-0002, P2-652/C2-1378, Weight Set 2: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading			
	<u>nary Pressure Standard</u> atic Absolute or Gauge Dead Weight Tester Part Number	r: PG7601 S/N	161	
	Piston/Cylinder: S/N 305, Mass Set: S/N 2052 Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0 Accuracy: 0.002 percent of reading	).29 to 50 psi [2	to 345 kPa] gauge mode	
DH Prin	mary Pressure Standard			
Pneuma	atic Gauge Dead Weight Tester, Model 5203, S/N 5557			
	Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/I Range: 20 to 1,600 psi [0.14 to 11 MPa] Accuracy: 0.005 percent of reading	Ņ 3293		
DH Prir	mary Pressure Standard			
	erated Gauge Dead Weight Tester, Model 5306, S/N 350	5		
×	Piston/Cylinder: S/N 3375, Mass Set: S/N 2032 Range: 40 to 20,000 psi [0.3 to 138 MPa] Accuracy: 0.01 percent of reading above 200 psi [1.4 cor 0.02 psi [0.14 kPa] at lower pressure	-		
	Piston/Cylinder: S/N 3511, Mass Set: S/N 2032 Range: 145 to 72,500 psi [1 to 500 MPa] Accuracy: 0.02 percent of reading above 725 psi [5 or 0.145 psi [1 kPa] at lower pressure		PARO	
	(105 (10 ) ) Tested By: 7	M	DATE: 6/26/12	
\$		(		

CINIDED AND

Digiquartz® Pressure Instrumentation

Document No. 8145-001, Rev. P 9/22/10

# Paroscientific, Inc. Pressure Instrument Configuration

**SN: 105210** Part Number: 1100-019-0 Model: 765-3K Port: Oil Filled

Calibration Date: 26-Jun-12 Report No: 14293 Technician: RM

Pressure Range: 0 to 3000 psia Temperature Range: 0 to 40 deg C

Customer: Mosaic Potash Hersey Report Date: 26-Jun-12
Address: 1395 135th Avenue Sales Order: 30096
Hersey, MI 49639 USA S/R Number: 10251

Conf	iguration	Ca.	libration (	oefficients
Conf  BL: 0  BR: 9600  DD: -  DL: 0  DM: 0  DO: -  DP: 6  ID: 07  IM: -  LL: -  LH: -  MC: Y  MD: 1  MN: 765-3K  OP: -  PF: 3000.000  PI: 4670  PL: 3600.000  PO: 0  PR: 238  PS: 0  AL: .0000000  AU: 3000.000  GD: 0  GT: 0  LW: 0	PT: N QD: - QO: - SL: - SN: 105210 ST: - SU: 0 TI: 4670 TR: 952 TU: 0 UF: 1.000000 UL: UM: USER UN: 1 US: 0 VR: P1.06 ZI: 0 ZS: 0 ZL: 0 ZV: .0000000	U0: Y1: Y2: Y3: C1: C2: C3: D1: D2: T1: T2: T4: T5: TC: PA:	5.813680 -3958.154 -13865.89 -138805.8 -14414.57 -99.30154 48299.55 0.0446906 0.0000000 30.00206 0.820646 54.13041 71.54495	psec deg C / psec deg C / psec² deg C / psec³ psi psi / psec psi / psec²
GD: 0 GT: 0				
RU: -				

Paroscientific, Inc.

4500 148th Ave NE Redmond, WA 98052

Phone: (425)883-8700 Fax: (425)867-5407

Web:http://www.paroscientific.com

Email: support@parosgientific.com

CION, NECTOR

Prepared by





Page 1 of 1



Mosaic Potash Hersey LLC 1395 135<sup>th</sup> Avenue Hersey, MI 49639 www.mosaicco.com Tel 231-832-8800 Fax 231-832-3349

September 25<sup>th</sup>, 2012



OCT 01 2012

UC BRANCH EPA, REGION 5

Lisa Perenchio, Chief Underground Injection Control Branch United States Environmental Protection Agency 77 W. Jackson Blvd, WU-16J Chicago, IL 60604-3590

RE:

M-474 / MI-133-3G-A002 Part I MIT on Well KCL 1061

The Part 1 Mechanical Integrity Test was passed for Well 1061 on September 25<sup>th</sup>, 2012. The EPA did not witness the test per instructions from Jeff McDonald of USEPA. Ray Vugrinovich of the Michigan Department of Environmental Quality was present to witness the test. The DEQ Annular Pressure Test form completed by Mr. Vugrinovich is enclosed. The USEPA Standard Annular Pressure Test form for an un-witnessed test is enclosed, along with the calibration certification for the pressure gauge that was used.

If you need additional information, please contact me at 231-832-8824 or douglas.patulski@mosaicco.com.

Sincerely,

Douğlas M. Patulski Minefield Superintendent Mosaic Potash Hersey

Cc: Raymond Vugrinovich, Michigan Department of Environmental Quality

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

## STANDARD ANNULAR PRESSURE TEST

Address   1395   135 Th AVE
Mell Name   Messale   106   Well Type   TTE
Well Name   Mosaic   106   Well Type   TT
Section   16   ; Range   09   W   ; Township   17   N   ; County   05 C F O LA
Section   16   ; Range   09   W   ; Township   17   N   ; County   05 C F O LA
Type of Pressure Gauge
New Gauge? Yes ~ 16 ~ 1f no, date of calibration   6/26/7017.     Calibration certification submitted?   No ~     TEST RESULTS   5-year or annual test on time? Yes ~ 10     After rework? Yes ~ 10     Newly permitted well? Ye
Calibration certification submitted? As No ~  TEST RESULTS  5-year or annual test on time? Yes ~ No After rework? Yes ~ No Newly permitted well? Yes ~ No N
TEST RESULTS   5-year or annual test on time? Yes ~ Mo   After rework? Yes ~ Mo   Newly permitted well? Yes ~ Mo   Newly permitted
After rework? Yes ~ No  Newly permitted well? Yes ~ No  Pressure (in psig)  Time Annulus Tubing  10:55 /123. L189 NONE Casing size 7" 23" 6 7643  11:00 /119. 9221 Tubing size NONE  11:05 /116. 5323 Packer type BRIDER ALUG  11:15 /112. /290  11:15 /112. /290  11:10 /110. 4460 Fluid return (gal.) N/A
Newly permitted well? Yes ~ No
Pressure (in psig)         Time       Annulus       Tubing         10:55       1123. Li89       NONE         11:00       1119. 9221       Tubing size       NONE         11:05       1116. 5323       Packer type       BRIDGE ALUG         11:10       1114.1445       Packer set @ L093'         11:15       1112.1290         11:20       1110.4460       Fluid return (gal.)       N/A -
Time Annulus Tubing   10:55
10:55
11:00       1119.9221       Tubing size NONE         11:05       116.5323       Packer type BRIDEE ALUG         11:10       114.1445       Packer set @ LOG3'         11:15       1112.1290         11:20       1110.4460       Fluid return (gal.) N/A
11.05       #116.5323       Packer type       BRIDGE ALUG         11.10       //14.1445       Packer set @ 6093'         /1.15       //12.1290         //20       //20         Fluid return (gal.)       N/A
11. 10       ///445       Packer set @ 6093'         //. 15       ///20       Fluid return (gal.)         ///20       ////A -
//. 15 ///20 //// //// ///// ////// //////////
Test Pressures: Max. Allowable Pressure Change: Initial test pressure x .03
Half Hour Pressure change 14.6343 psi
Test Passed > Test Failed ~
If failed test, well must shut in, no injection can occur, and USEPA must be contacted within 24 hours.
Corrective action needs to occur, the well retested, and written authorization received before injection can
recommence.
8° 4/1/
Signature of Company Representative  Date

UNWITNESSED MECHANICAL INTEGRITY TEST FORM

**ANNULAR PRESSURE TEST** 

	Permit Number M474 MI-133-3G-A002				
By authority of Part 615 or Part 625 of Act 451 PA 1994, as amended. Non-submission and/or falsification of this information	Well name & No. Kalium Hersey No. 1061				
may result in fines and/or imprisonment.	Surface location  NW - 1/4 of SW 1/4 of NW 1/4, Section 26 T 17N R 09W				
Name and address of permittee Mosaic Potash Hersey LLC	Township <b>Hersey</b>	County Osceola			
1395 135th Avenue Hersey, MI 49639		Well type			
tiology, in Arroso	Part 615 Secondary red	covery Brine disposal			
		· <del>_</del>			
	Part 625 Waste dispos	al Solution mining			
9/25/2012	Casing 7" 23# @ 7643 feet	None in Hole			
Type of gauge PAROSCIENTIFIC HODEL 765-31	Packer type/model	Packer depth			
inch face DIGITAL psi range 0-3000	BRIDGE PUIG	6094'			
New gauge Yes No	Type of non-corrosive				
if no, enter date of test calibration 6/26/2012	liquid in the annulus				
Average rate during injection	Maximum allowed injection pres	sure			
	ST DATA				
	readings (psig)	•			
Time Annulus tubing	Time A	nnulus tubing			
1055 1123.6189					
1100 1119.9221	·	·			
1105 1116.5323					
1110 1114 1445					
1115 /1/2/1290	The state of the s				
1120 1110.4460	2 (2 (2))				
1125 1108 984 6		8			
		UCT <b>0 1</b> 2012			
:	Sec.	FDA PECIONE			
	**	and the second s			
V .					
Comments WELL WAS TAKEN OFF LINE 9/21 3% CHANGE: 33,7086 PSIG; 5% WELL DEMONSTRATES INTERNAL MO	/2012 . OBSERVED CH CHANGE: 56.1089 PS	IANGE: 14,6343 psic;			
WELL DEMONSTRATES INTERIOR		•			
Certification if witnessed by DEQ representative:	0				
Signature of DEQ employee Taymon Myunova	· · · · · · · · · · · · · · · · · · ·	/25/2012			
Certification if not witnessed by DEQ(persentative: "I state that I am autidirection. The facts stated herein are true, accurate and complete to the I	best of my knowledge."				
Signature		9/25/2012			
MAIL TO: OFFICE OF GEOLOGICAL SURVEY	Date	11-16-16			
MICHIGAN DEPARTMENT OF ENVIRONME	ENTAL OHALITY				

PO BOX 30256

LANSING MI 48909-7756

EQP 7606 (rev. 8/2004)

4500 148th Avenue N. E.

Facsimile: (425) 867-5407 Redmond, WA 98052-5194 Email: support@paroscientific.com Telephone: (425) 883-8700 Internet:http://www.paroscientific.com

## CERTIFICATE OF CONFORMANCE

CUSTOMER:	MOSAIC POTASH HERSEY		
PURCHASE ORDER:	CHARGE		
DIGIQUARTZ MODEL:	765-3K		
PART NUMBER:	1100-019-0		
SERIAL NUMBER(S):	105210		

PAROSCIENTIFIC INCORPORATED certifies that the part(s) identified above complies with the requirements of the above order and has been manufactured in accordance with engineering drawings, material and process specifications, testing procedures, and applicable specification drawing of Paroscientific Incorporated. The Digiquartz model(s) identified has been calibrated and tested over the specified pressure and temperature range and meets the requirements of the applicable specification drawing. Primary pressure, temperature standards and transfer standards used at Paroscientific Incorporated for calibration and testing have traceability to the National Institute of Standards and Technology and are regularly checked and calibrated according to Paroscientific QA Procedure Q8521, Inspection Test and Measurement Equipment, in accordance with the requirements of ISO 9001:2008.

Wanes Schulman

6/26/12

**AUTHORIZED SIGNATURE** 

DATE

Warren Schuchman, Quality Assurance Manager

Technology

Precision Pressure Instrumentation

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4500 148th Avenue N.E. Redmond, WA 98052-5194 Telephone: (425) 883-8700

Facsimile: (425) 867-5407 Email: support@paroscientific.com Internet:http://www.paroscientific.com

# CERTIFICATION OF TRACEABILITY TO NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY

Primary pressure and temperature standards used in the calibration and testing of Paroscientific Digiquartz Models have traceability to the National Institute of Standards and Technology through the following documentation.

#### Bell and Howell Primary Pressure Standard:

Bell and Howell, Model 6-201-0001, Piston/Cylinder P2-919/C2-1523 via DH Calibration Report No. 15441 and 16653 traceable to NIST. Weight Set 1, P/N 6-002-0002, via DH Calibration Report No. 14481, 16654 and 1284473284 traceable to NIST. Weight Set 2, P/N 6-002-0002, via DH Calibration Report No. 14576, 16603, 31227, 39628, 68390 and 1317389777 traceable to NIST. Piston/Cylinder P2-652/C2-1378 via DH Instruments Calibration Report No. 14575, 16602, 31226, 39627, 68389 and 1317739617 traceable to NIST. Piston/Cylinder P1-231/C1-384 via DH Instruments Calibration Report No. 13170 and 1284475131 traceable to NIST. Piston/Cylinder P/N 6-201, No. P1-949/C1-922, via DH Instruments Calibration Report 17176 and 17445, traceable to NIST.

#### DH Primary Pressure Standard, Oil Operated Gauge:

DH instruments, Model 5306, Piston/Cylinder S/N 3375, via DH Calibration Certificate Report No. 8398, 22146, 32354, 45306, 66563 and 1305698573 traceable to NIST. Piston/Cylinder 3511 via DH Calibration Report No. 8399, 22147, 32353, 45307, 66562 and 1305625084 traceable to NIST. Mass Set S/N 2032 via DH Calibration Report No. 24809, 24826, 45305, 45308, 1305538925 and 1305530461 traceable to NIST.

#### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH Instruments, Model 5203, Piston/Cylinder S/N 4845, via DH Calibration Certificate No. 8541, 27161, 38275 and 1300177141 traceable to NIST. Mass Set S/N 2032/3293 via DH Calibration Certificate Nos.4630, 24809, 8540, 32142, 45305 and 1300200369 traceable to NIST.

### DH Primary Pressure Standard, Pneumatic Operated Gauge:

DH instruments, Model PG7601 via DH Instruments Calibration No. 32162, 41492 and 69127 traceable to NIST. Piston/Cylinder S/N 305 via DH Instruments Calibration No. 20281, 32161, 41490 and 69125 traceable to NIST. DH Instruments 35 kg Mass Set No. 2052 and Bell No. 261A via DH Instruments Calibration Report No. 20282, 32163, 32164, 41491, 41493, 69126 and 69124 traceable to NIST.

#### Hygroclip S3 MET4/4A Part number 1560-XXX and 1561-XXX:

Humidity and Temperature calibrations are traceable to NIST through Rotronic Instrument Corporation; 160 E. Main Street, Huntington, NY 11743.

## Hygroclip HC2-S3 MET4/4A Part number 1563-XXX and 1564-XXX Swiss Calibration Service (SCS)

Humidity and Temperature calibrations are traceable to SCS through Rotronic AG Grindelstrasse 6 8303 Bassersdorf Phone: 044-838-1111 E-mail: into@rotronic.ch

Digiquartz®
Technology

Precision Pressure Instrumentation

Document no. T8148, Rev "AU", 11 Oct 2011 page 2 of 2

Ari ISO9001:2008 registered company

4500 148th Avenue N. E. Facsimile: (425) 867-5407 Redmond, WA 98052-5194 Email:support@paroscientific.com Telephone: (425) 883-8700 Internet:http://www.paroscientific.com

### CERTIFICATE OF CALIBRATION

DIGIQUARTZ MODEL: 765-3K SERIAL NUMBER(S): 105210

The Paroscientific Digiquantz Model (s) identified above has been calibrated and tested with one or more of the following primary pressure standards. All have traceability to the National Institute of Standards and Technology.

3ell and	Howell Primary Pressure Standard		•
Pneuma	atic Absolute or Gauge Dead Weight Tester Part Number:	6-201-0001, 8	5/N 4034 and S/N 1014
	Piston/Cylinder: 6-001-0002, P2-919/C2-1523, Weight Set 1: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading		Piston/Cylinder: 6-001-0001, P1-949/C1-922, Weight Set 2: 6-002-0002 Range: 0.3 to 5 psi [2 to 34 kPa] Accuracy: 0.015 percent of reading
<b>X</b>	Piston/Cylinder: 8-001-0002, P2-652/C2-1378, Weight Set 2: 6-002-0002 Range: 1.5 to 50 psi [10 to 345 kPa] Accuracy: 0.010 percent of reading		
	mary Pressure Standard		
Pneum	atic Absolute or Gauge Dead Weight Tester Part Number:	: PG7601 S/N	161
	Piston/Cylinder: S/N 305, Mass Set: S/N 2052 Range: 0.7 to 50 psi [5 to 345 kPa] absolute mode, 0. Accuracy: 0.002 percent of reading	29 to 50 psi [2	to 345 kPa] gauge mode
DH Pris	mary Pressure Standard		
Pneum	atic Gauge Dead Weight Tester, Model 5203, S/N 5557		
	Piston/Cylinder: S/N 4845, Mass Sets: S/N 2032, S/N Range: 20 to 1,600 psi [0.14 to 11 MPa]  Accuracy: 0.005 percent of reading	1 3293	
DH Pri	mary Pressure Standard		
Oil Ope	erated Gauge Dead Weight Tester, Model 5306, S/N 3505	5	
⊠	Piston/Cylinder: S/N 3375, Mass Set: S/N 2032 Range: 40 to 20,000 psi [0.3 to 138 MPa] Accuracy: 0.01 percent of reading above 200 psi [1.4 or 0.02 psi [0.14 kPa] at lower pressure	-	
	Piston/Cylinder: S/N 3511, Mass Set: S/N 2032 Range: 145 to 72,500 psi [1 to 500 MPa] Accuracy: 0.02 percent of reading above 725 psi [5 Mor 0.145 psi [1 kPa] at lower pressure	MPa]	(PARO)
		/ N/	

Digiquartz® Pressure Instrumentation

Document No. 8145-001, Rev. P 9/22/10

# Paroscientific, Inc. Pressure Instrument Configuration

**SN: 105210** Part Number: 1100-019-0 Model: 765-3K Port: 0il Filled

Calibration Date: 26-Jun-12 Report No: 14293 Technician: RM

Pressure Range: 0 to 3000 psia Temperature Range: 0 to 40 deg C

Customer: Mosaic Potash Hersey Report Date: 26-Jun-12
Address: 1395 135th Avenue Sales Order: 30096

Hersey, MI 49639 USA S/R Number : 10251

Confligurat	ion	Cal	ibration (	oefficients
BL: 0 PT BR: 9600 QD DD: - QO DL: 0 SL DM: 0 SN DO: - ST DP: 6 SU ID: 07 TI IM: - TR IL: - TU LH: - UF MC: Y UL MD: 1 UM MN: 765-3K UN OP: - US PF: 3000.000 VR PI: 4670 ZI PC: 0 ZI	: N : - : - : 105210 : - : 0 : 4670 : 952 : 0 : 1.000000	U0: Y1: Y2: Y3: C1: C2: C3: D1: D2: T1: T2: T4: T5: PA: PM:	-13865.89 -138805.8 -14414.57 -99.30154 48299.55 0.0446906 0.0000000 30.00206 0.820646 54.13041 71.54495	deg C / µsec deg C / µsec² deg C / µsec³ psi psi / µsec psi / µsec²

Paroscientific, Inc.

4500 148th Ave. N.E. Redmond, WA 98052 Phone: (425)883-8700 Fax: (425)867-5407

Web:http://www.paroscientific.com Email: support@paroscientific.com Prepared by







December 10, 2012

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UIC BRANCH EPA, REGION 5

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: Lisa Perenchio

RE: Class III Solution Mining Wells Permit No. MI-133-3G-A002

Monthly Report for November 2012

During the month of November, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 30 days this month.
- Cavity KCl 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 30 days this month.
- Cavity KCI 1060 was in operation for 30 days this month.
- Cavity KCI 2030 was in operation for 30 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 30 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments



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# **CAVITY 1010**

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Cavity 1010

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Nov-12	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in
15-Nov-12	shut in	shut in	shut in
16-Nov-12	shut in	shut in	shut in
17-Nov-12	shut in	shut in	shut in
18-Nov-12	shut in	shut in	shut in
19-Nov-12	shut in	shut in	shut in
20-Nov-12	shut in	shut in	shut in
21-Nov-12	shut in	shut in	shut in
22-Nov-12	shut in	shut in	shut in
23-Nov-12	shut in	shut in	shut in
24-Nov-12	shut in	shut in	shut in
25-Nov-12	shut in	shut in	shut in
26-Nov-12	shut in	shut in	shut in
27-Nov-12	shut in	shut in	shut in
28-Nov-12	shut in	shut in	shut in
29-Nov-12	shut in	shut in	shut in
30-Nov-12	shut in	shut in	shut in

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Cavity 1020

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Nov-12	1027	149	170
2-Nov-12	1008	156	176
3-Nov-12	1010	164	194
4-Nov-12	1022	149	181
5-Nov-12	1056	159	188
6-Nov-12	1031	160	174
7-Nov-12	1023	162	181
8-Nov-12	1026	164	181
9-Nov-12	1044	154	181
10-Nov-12	1032	167	175
11-Nov-12	1027	151	158
12-Nov-12	999	143	172
13-Nov-12	962	137	187
14-Nov-12	984	147	184
15-Nov-12	969	152	187
16-Nov-12	961	156	193
17-Nov-12	958	162	195
18-Nov-12	964	150	190
19-Nov-12	1049	182	192
20-Nov-12	989	170	220
21-Nov-12	957	157	218
22-Nov-12	946	184	229
23-Nov-12	955	207	251
24-Nov-12	948	203	237
25-Nov-12	944	205	236
26-Nov-12	947	205	235
27-Nov-12	947	211	239
28-Nov-12	958	173	234
29-Nov-12	961	208	259
30-Nov-12	1057	307	312



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Nov-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

992

173

204

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

30-Nov-12

1057

307

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

25-Nov-12

944

205

Maximum Injection Flow Rate and corresponding Injection Pressure

307

Date 30-Nov-12

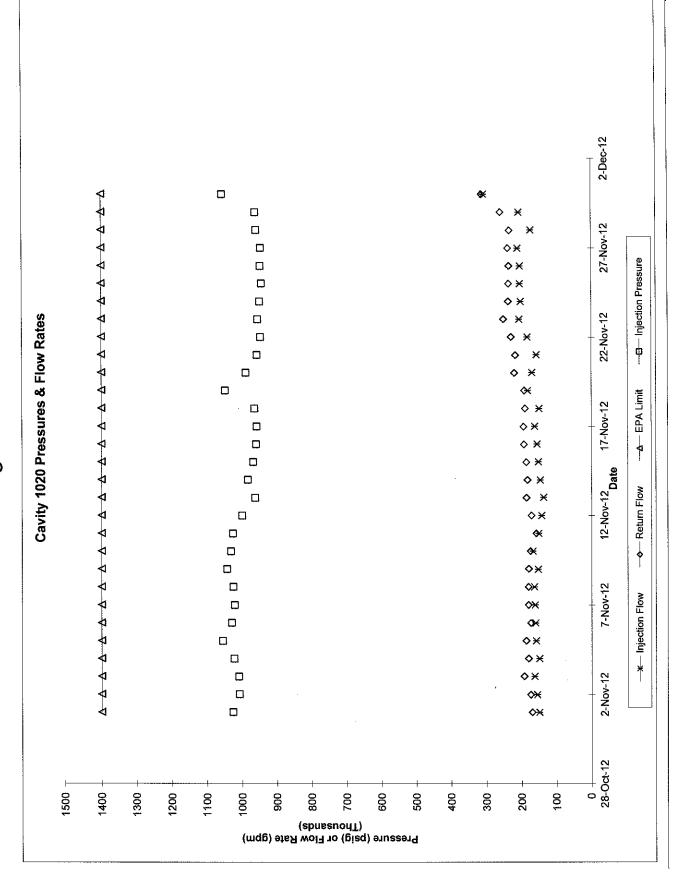
Injection Flow (gpm)

Injection Pressure (psi)

1057

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Cavity 1040

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Nov-12	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in
15-Nov-12	shut in	shut in	shut in
16-Nov-12	shut in	shut in	shut in
17-Nov-12	shut in	shut in	shut in
18-Nov-12	shut in	shut in	shut in
19-Nov-12	shut in	shut in	shut in
20-Nov-12	shut in	shut in	shut in
21-Nov-12	shut in	shut in	shut in
22-Nov-12	shut in	shut in	shut in
23-Nov-12	shut in	shut in	shut in
24-Nov-12	shut in	shut in	shut in
25-Nov-12	shut in	shut in	shut in
26-Nov-12	shut in	shut in	shut in
27-Nov-12	shut in	shut in	shut in
28-Nov-12	shut in	shut in	shut in
29-Nov-12	shut in	shut in	shut in
30-Nov-12	shut in	shut in	shut in



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Cavity 1050

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Nov-12	1133	147	147
2-Nov-12	1133	119	119
3-Nov-12	1173	140	140
4-Nov-12	1190	133	133
5-Nov-12	1125	139	139
6-Nov-12	1100	144	144
7-Nov-12	1173	133	133
8-Nov-12	1185	127	127
9-Nov-12	1163	161	161
10-Nov-12	1148	146	146
11-Nov-12	1163	146	146
12-Nov-12	1160	144	144
13-Nov-12	1155	127	127
14-Nov-12	1130	130	130
15-Nov-12	1113	140	140
16-Nov-12	1165	135	135
17-Nov-12	1140	146	146
18-Nov-12	1185	120	120
19-Nov-12	1170	152	152
20-Nov-12	1150	165	165
21-Nov-12	1143	137	137
22-Nov-12	1133	132	132
23-Nov-12	1100	124	124
24-Nov-12	1123	134	134
25-Nov-12	1130	157	157
26-Nov-12	1165	142	142
27-Nov-12	1175	110	110
28-Nov-12	1140	147	147
29-Nov-12	1138	135	135
30-Nov-12	1175	113	113

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Nov-12 Monthly Averages

Injection Pressure (psi) 1149 Injection Flow (gpm)

Return Flow (gpm)

138

138

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi) 1190 Injection Flow (gpm) 133

4-Nov-12

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Nov-12

1100

144

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

20-Nov-12

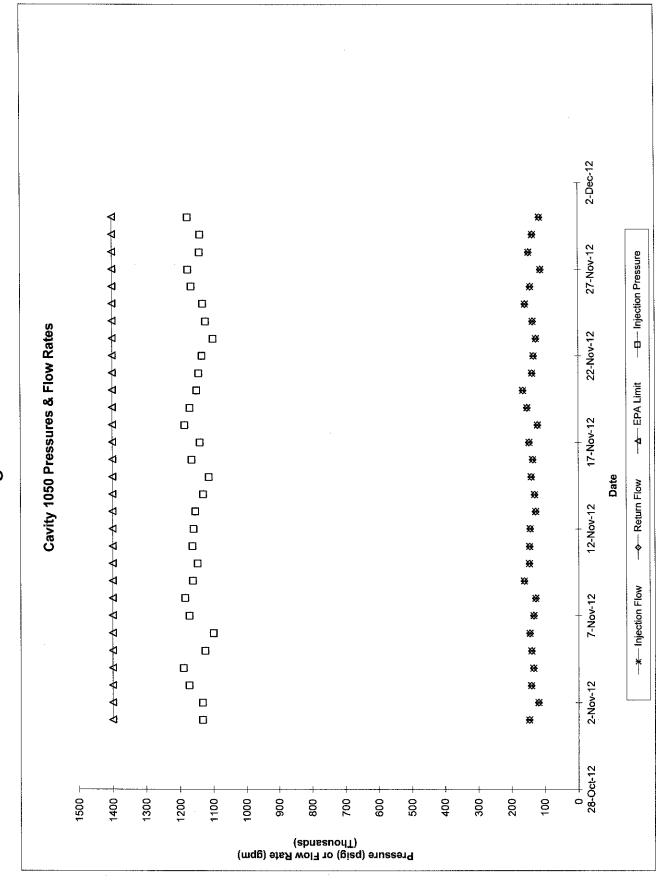
Injection Flow (gpm)

Injection Pressure (psi)

1150

165





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Cavity 1060

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Nov-12	1027	222	241
2-Nov-12	1008	222	245
3-Nov-12	1010	264	270
4-Nov-12	1022	257	257
5-Nov-12	1056	257	271
6-Nov-12	1031	257	261
7-Nov-12	1023	250	254
8-Nov-12	1026	257	258
9-Nov-12	1044	250	278
10-Nov-12	1032	257	269
11-Nov-12	1027	<b>271</b>	276
12-Nov-12	999	264	278
13-Nov-12	962	257	277
14-Nov-12	984	250	275
15-Nov-12	969	243	273
16-Nov-12	961	250	279
17-Nov-12	958	250	275
18-Nov-12	964	236	255
19-Nov-12	1049	194	234
20-Nov-12	989	215	237
21-Nov-12	957	222	232
22-Nov-12	946	215	233
23-Nov-12	955	201	225
24-Nov-12	948	194	214
25-Nov-12	944	201	212
26-Nov-12	947	194	208
27-Nov-12	947	194	209
28-Nov-12	958	167	197
29-Nov-12	961	188	196
30-Nov-12	0	0	132



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Nov-12 Monthly Averages

Injection Pressure

957

Injection Flow

223

Return Flow

244

Maximum Injection Pressure and corresponding Injection Flow

Date

5-Nov-12

Injection Pressure

1056

Injection Flow

257

Minimum Injection Pressure and corresponding Injection Flow

Date 30-Nov-12 Injection Pressure 0 Injection Flow

0

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

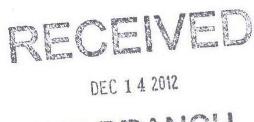
11-Nov-12

Injection Flow

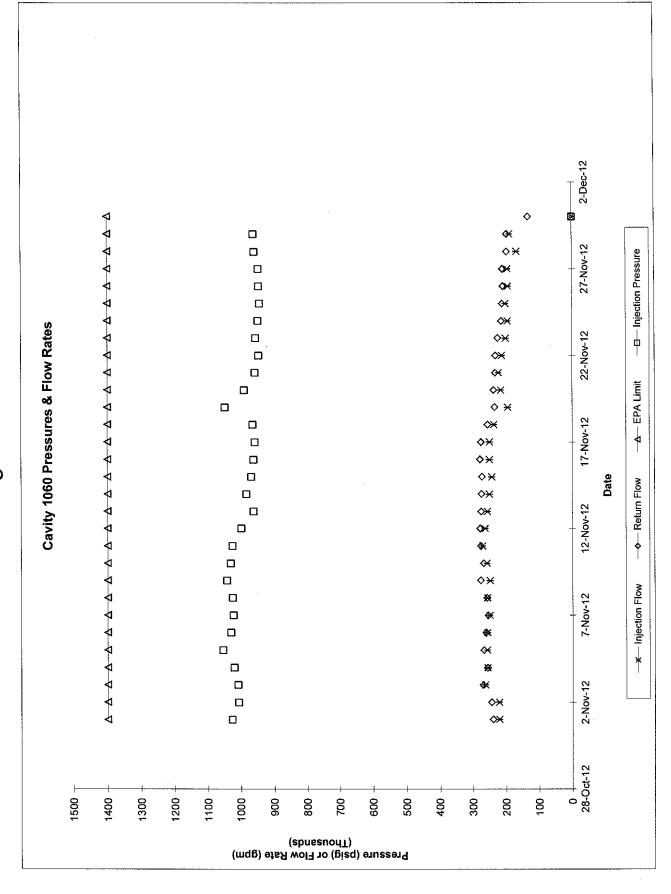
271

Injection Pressure

1027







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Cavity 2030

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Nov-12	1133	277	277
2-Nov-12	1133	265	265
3-Nov-12	1173	317	317
4-Nov-12	1190	307	307
5-Nov-12	1125	293	293
6-Nov-12	1100	289	289
7-Nov-12	1173	306	306
8-Nov-12	1185	299	299
9-Nov-12	1163	278	278
10-Nov-12	1148	290	290
11-Nov-12	1163	310	310
12-Nov-12	1160	298	298
13-Nov-12	1155	301	301
14-Nov-12	1130	291	291
15-Nov-12	1113	300	300
16-Nov-12	1165	314	314
17-Nov-12	1140	292	292
18-Nov-12	1185	294	294
19-Nov-12	1170	290	290
20-Nov-12	1150	294	294
21-Nov-12	1143	284	284
22-Nov-12	1133	296	296
23-Nov-12	1100	296	296
24-Nov-12	1123	289	289
25-Nov-12	1130	302	302
26-Nov-12	1165	299	299
27-Nov-12	1175	292	292
28-Nov-12	1140	288	288
29-Nov-12	1138	275	275
30-Nov-12	1175	271	271



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Nov-12 Monthly Averages

Injection Pressure (psi)

1149

Injection Flow (gpm)

293

Return Flow (gpm)

293

Maximum Injection Pressure and corresponding Injection Flow

Date 4-Nov-12 Injection Pressure (psi)

Injection Flow (gpm)

1190

307

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Nov-12

1100

289

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

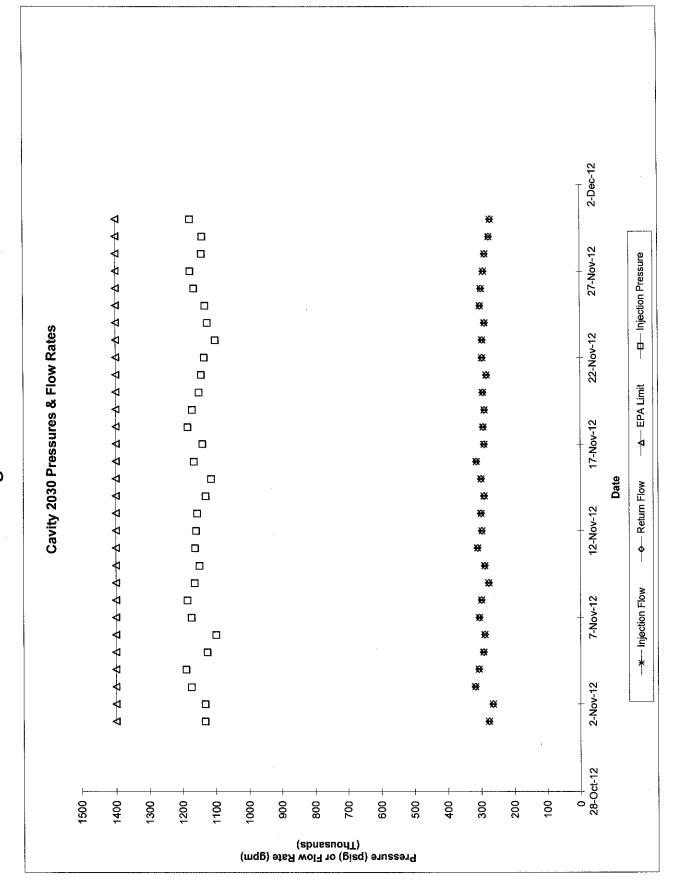
Injection Pressure (psi)

3-Nov-12

317

1173





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### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Nov-12	shut in	shut in	shut in
2-Nov-12	shut in	shut in	shut in
3-Nov-12	shut in	shut in	shut in
4-Nov-12	shut in	shut in	shut in
5-Nov-12	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in
15-Nov-12	shut in	shut in	shut in
16-Nov-12	shut in	shut in	shut in
17-Nov-12	shut in	shut in	shut in
18-Nov-12	shut in	shut in	shut in
19-Nov-12	shut in	shut in	shut in
20-Nov-12	shut in	shut in	shut in
21-Nov-12	shut in	shut in	shut in
22-Nov-12	shut in	shut in	shut in
23-Nov-12	shut in	shut in	shut in
24-Nov-12	shut in	shut in	shut in
25-Nov-12	shut in	shut in	shut in
26-Nov-12	shut in	shut in	shut in
27-Nov-12	shut in	shut in	shut in
28-Nov-12	shut in	shut in	shut in
29-Nov-12	shut in	shut in	shut in
30-Nov-12	shut in	shut in	shut in



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Cavity 2061

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Nov-12	1133	121	121
2-Nov-12	1137	118	118
3-Nov-12	1173	132	132
4-Nov-12	1190	130	130
5-Nov-12	1125	155	155
6-Nov-12	1100	149	149
7-Nov-12	1173	126	126
8-Nov-12	1185	132	132
9-Nov-12	1163	132	132
10-Nov-12	1148	116	116
11-Nov-12	1163	121	121
12-Nov-12	1160	121	121
13-Nov-12	1135	131	131
14-Nov-12	1130	134	134
15-Nov-12	1113	120	120
16-Nov-12	1165	124	124
17-Nov-12	1140	139	139
18-Nov-12	1185	131	131
19-Nov-12	1170	119	119
20-Nov-12	1150	122	122
21-Nov-12	1143	120	120
22-Nov-12	1133	132	132
23-Nov-12	1100	138	138
24-Nov-12	1123	128	128
25-Nov-12	1130	111	111
26-Nov-12	1165	119	119
27-Nov-12	1175	120	120
28-Nov-12	1140	99	99
29-Nov-12	1138	132	132
30-Nov-12	1175	91	91

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Nov-12 Monthly Averages

Injection Pressure (psi)

1149

Injection Flow (gpm)

125

Return Flow (gpm)

125

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

4-Nov-12

1190

130

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Nov-12

1100

149

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (psi)

Injection Pressure (psi)

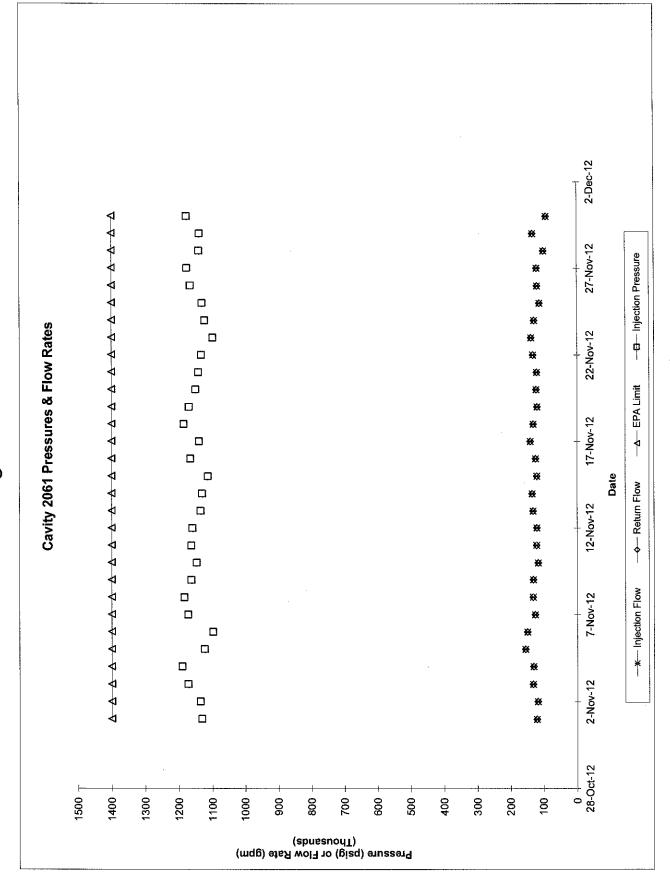
5-Nov-12

155

1125



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#### **Daily Averages**

A American Commence of the	Injection	Injection	Return
Date	Pressure	Flow	Flow
Date	(psi)	(gpm)	(gpm)
1-Nov-12	shut in	shut in	shut in
de management de la constanta	Shut in	shut in	shut in
3-Nov-12			shut in
4-Nov-12	shut in	shut in	
5-Nov-12	shut in	shut in	shut in
	shut in	shut in	shut in
6-Nov-12	shut in	shut in	shut in
7-Nov-12	shut in	shut in	shut in
8-Nov-12	shut in	shut in	shut in
9-Nov-12	shut in	shut in	shut in
10-Nov-12	shut in	shut in	shut in
11-Nov-12	shut in	shut in	shut in
12-Nov-12	shut in	shut in	shut in
13-Nov-12	shut in	shut in	shut in
14-Nov-12	shut in	shut in	shut in
15-Nov-12	shut in	shut in	shut in
16-Nov-12	shut in	shut in	shut in
17-Nov-12	shut in	shut in	shut in
18-Nov-12	shut in	shut in	shut in
19-Nov-12	shut in	shut in	shut in
20-Nov-12	shut in	shut in	shut in
21-Nov-12	shut in	shut in	shut in
22-Nov-12	shut in	shut in	shut in
23-Nov-12	shut in	shut in	shut in
24-Nov-12	shut in	shut in	shut in
25-Nov-12	shut in	shut in	shut in
26-Nov-12	shut in	shut in	shut in
27-Nov-12	shut in	shut in	shut in
28-Nov-12	shut in	shut in	shut in
29-Nov-12	shut in	shut in	shut in
30-Nov-12	shut in	shut in	shut in



DEC 1 4 2012



July 17, 2012



JUL 2 0 2012

UIC BRANCH EPA, REGIONS

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: Lisa Perenchio

RE: Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for June 2012

During the month of June, Mosaic Potash solution well operations were as follows:

- Cavity KCl 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 21 days this month.
- Cavity KCl 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 30 days this month.
- Cavity KCI 1060 was in operation for 8 days this month.
- Cavity KCI 2030 was in operation for 30 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCl 2061 was in operation for 30 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments



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### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jun-12	shut in	shut in	shut in
2-Jun-12	shut in	shut in	shut in
3-Jun-12	shut in	shut in	shut in
4-Jun-12	shut in	shut in	shut in
5-Jun-12	shut in	shut in	shut in
6-Jun-12	shut in	shut in	shut in
7-Jun-12	shut in	shut in	shut in
8-Jun-12	shut in	shut in	shut in
9-Jun-12	shut in	shut in	shut in
10-Jun-12	shut in	shut in	shut in
11-Jun-12	shut in	shut in	shut in
12-Jun-12	shut in	shut in	shut in
13-Jun-12	shut in	shut in	shut in
14-Jun-12	shut in	shut in	shut in
15-Jun-12	shut in	shut in	shut in
16-Jun-12	shut in	shut in	shut in
17-Jun-12	shut in	shut in	shut in
18-Jun-12	shut in	shut in	shut in
19-Jun-12	shut in	shut in	shut in
20-Jun-12	shut in	shut in	shut in
21-Jun-12	shut in	shut in	shut in
22-Jun-12	shut in	shut in	shut in
23-Jun-12	shut in	shut in	shut in
24-Jun-12	shut in	shut in	shut in
25-Jun-12	shut in	shut in	shut in
26-Jun-12	shut in	shut in	shut in
27-Jun-12	shut in	shut in	shut in
28-Jun-12	shut in	shut in	shut in
29-Jun-12	shut in	shut in	shut in
30-Jun-12	shut in	shut in	shut in



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### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
VALUE OF THE PARTY	(psi)	(gpm)	(gpm)
1-Jun-12	1157	250	286
2-Jun-12	1181	297	319
3-Jun-12	1181	292	320
4-Jun-12	1157	291	326
5-Jun-12	1150	319	350
6-Jun-12	1154	299	324
7-Jun-12	1138	<b>√</b> 341	310
8-Jun-12	1133	308	337
9-Jun-12	1113	291	339
10-Jun-12	1162	327	341
11-Jun-12	1161	323	347
12-Jun-12	1158	313	345
13-Jun-12	1151	301	333
14-Jun-12	1112	317	354
15-Jun-12	shut in	shut in	shut in
16-Jun-12	shut in	shut in	shut in
17-Jun-12	shut in	shut in	shut in
18-Jun-12	shut in	shut in	shut in
19-Jun-12	shut in	shut in	shut in
20-Jun-12	shut in	shut in	shut in
21-Jun-12	shut in	shut in	shut in
22-Jun-12	shut in	shut in	shut in
23-Jun-12	shut in	shut in	shut in
24-Jun-12	1126	290	301
25-Jun-12	1120	306	318
26-Jun-12	1120	266	314
27-Jun-12	1080	307	318
28-Jun-12	1108	328	339
29-Jun-12	1123	337	368
30-Jun-12	1105	240	235



JUL 2 0 2012

Jun-12 / Monthly Averages

Injection Pressure (psi)

1138

Injection Flow (gpm)

302

Return Flow (gpm)

325

Maximum Injection Pressure and corresponding Injection Flow

Date 2-Jun-12 Injection Pressure (psi)

Injection Flow (gpm)

1181

297

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

27-Jun-12

1080

307

Maximum Injection Flow Rate and corresponding Injection Pressure

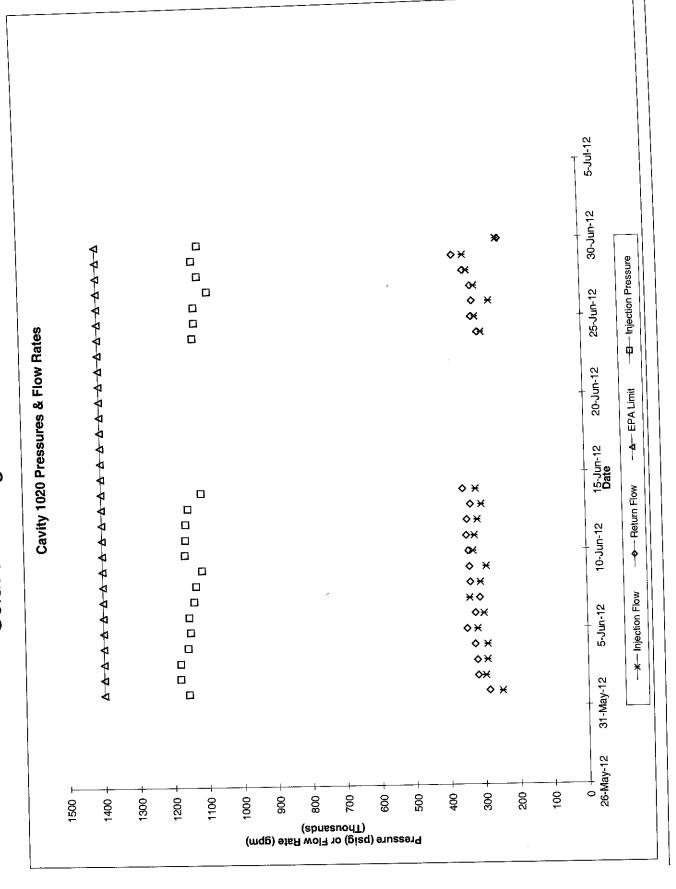
Date 7-Jun-12 Injection Flow (gpm)

Injection Pressure (psi)

1138



JUL 2 0 2012



#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jun-12	shut in	shut in	shut in
2-Jun-12	shut in	shut in	shut in
3-Jun-12	shut in	shut in	shut in
4-Jun-12	shut in	shut in	shut in
5-Jun-12	shut in	shut in	shut in
6-Jun-12	shut in	shut in	shut in
7-Jun-12	shut in	shut in	shut in
8-Jun-12	shut in	shut in	shut in
9-Jun-12	shut in	shut in	shut in
10-Jun-12	shut in	shut in	shut in
11-Jun-12	shut in	shut in	shut in
12-Jun-12	shut in	shut in	shut in
13-Jun-12	shut in	shut in	shut in
14-Jun-12	shut in	shut in	shut in
15-Jun-12	shut in	shut in	shut in
16-Jun-12	shut in	shut in	shut in
17-Jun-12	shut in	shut in	shut in
18-Jun-12	shut in	shut in	shut in
19-Jun-12	shut in	shut in	shut in
20-Jun-12	shut in	shut in	shut in
21-Jun-12	shut in	shut in	shut in
22-Jun-12	shut in	shut in	shut in
23-Jun-12	shut in	shut in	shut in
24-Jun-12	shut in	shut in	shut in
25-Jun-12	shut in	shut in	shut in
26-Jun-12	shut in	shut in	shut in
27-Jun-12	shut in	shut in	shut in
28-Jun-12	shut in	shut in	shut in
29-Jun-12	shut in	shut in	shut in
30-Jun-12	shut in	shut in	shut in



JUL 2 0 2012

## CAVITY 1050

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#### Daily Averages

Date	Injection Pressure	Injection Flow (gpm)	Return Flow (gpm)	
4.1.740	(psi)	155	155	
1-Jun-12	1175		154	
2-Jun-12	1180	154	160	
3-Jun-12	1200	160		
4-Jun-12	1167	149	149	
5-Jun-12	1182	169	169	
6-Jun-12	1183	149	149	
7-Jun-12	1200	157	157	
8-Jun-12	1175	174	174	
9-Jun-12	1185	147	147	
10-Jun-12	1144	144	144	
11-Jun-12	1138	128	128	
12-Jun-12	1200	163	163	
13-Jun-12	1153	148	148	
14-Jun-12	1158	162	162	
15-Jun-12	1183	151	151	
16-Jun-12	1163	137	137	
17-Jun-12	1188	170	170	
18-Jun-12	1165	148	148	
19-Jun-12	1156	√ 188	188	
20-Jun-12	1175	143	143	
21-Jun-12	1188	167	167	
22-Jun-12	1160	156	156	
23-Jun-12	1163	144	144	
24-Jun-12	1183	159	159	
25-Jun-12	1175	157	157	
26-Jun-12	1175	151	151	
27-Jun-12	√1208	169	169	
28-Jun-12	1170	156	156	
29-Jun-12	1188	140	140	
30-Jun-12	1200	127	127	

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Jun-12 Monthly Averages

Injection Pressure (psi)

1176

Injection Flow (gpm)

154

Return Flow (gpm)

154

Maximum Injection Pressure and corresponding Injection Flow

Date 27-Jun-12 Injection Pressure (psi)

Injection Flow (gpm)

1208

169

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

11-Jun-12

1138

128

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

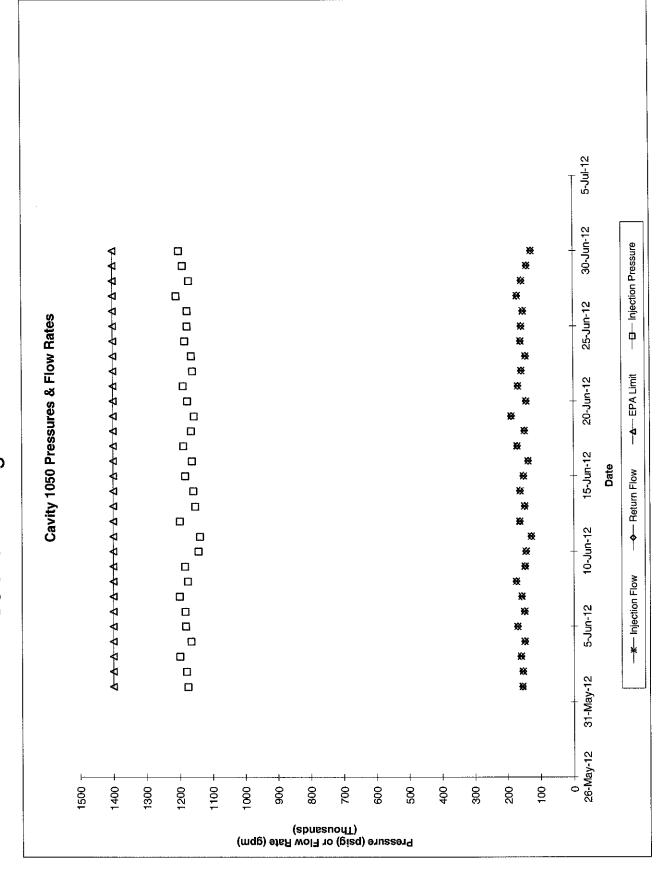
19-Jun-12

188

1156



JUL 2 0 2012



### CAVITY 1060 V

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#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Jun-12	shut in	shut in	shut in	
2-Jun-12	shut in	shut in	shut in	
3-Jun-12	shut in	shut in	shut in	
4-Jun-12	shut in	shut in	shut in	
5-Jun-12	shut in	shut in	shut in	
6-Jun-12	shut in	shut in	shut in	
7-Jun-12	shut in	shut in	shut in	
8-Jun-12	shut in	shut in	shut in	
9-Jun-12	shut in	shut in	shut in	
10-Jun-12	shut in	shut in	shut in	
11-Jun-12	shut in	shut in	shut in	
12-Jun-12	shut in	shut in	shut in	
13-Jun-12	shut in	shut in	shut in	
14-Jun-12	shut in	shut in	shut in	
15-Jun-12	shut in	shut in	shut in	
16-Jun-12	1111	340	337	
17-Jun-12	1129	340	343	
18-Jun-12	1145	326	344	
19-Jun-12	1125	313	290	
20-Jun-12	1121	299	304	
21-Jun-12	1106	306	318	
22-Jun-12	√1173	326	341	
23-Jun-12	1076	125	135	
24-Jun-12	shut in	shut in	shut in	
25-Jun-12	shut in	shut in	shut in	
26-Jun-12	shut in	shut in	shut in	
27-Jun-12	shut in	shut in	shut in	
28-Jun-12	shut in	shut in	shut in	
29-Jun-12	shut in	shut in	shut in	
30-Jun-12	shut in	shut in	shut in	



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Jun-12

Monthly Averages

Injection Pressure

1123

Injection Flow

297

Return Flow

302

Maximum Injection Pressure and corresponding Injection Flow

Date

22-Jun-12

Injection Pressure

1173

Injection Flow

326

Minimum Injection Pressure and corresponding Injection Flow

Date

23-Jun-12

Injection Pressure

1076

Injection Flow

125

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

16-Jun-12

Injection Flow

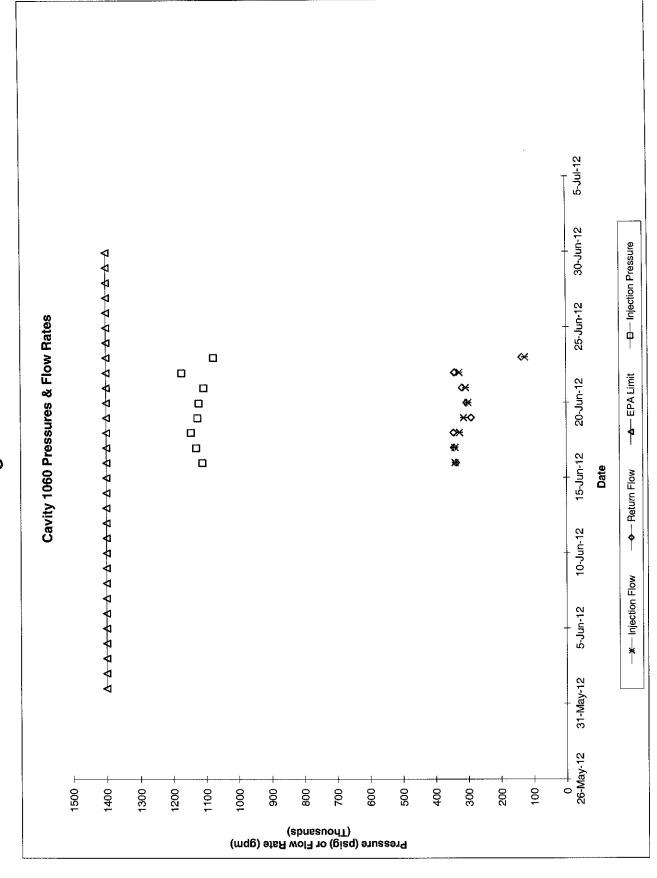
340

Injection Pressure

1111

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## CAVITY 2030

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Jun-12	1183	195	(gpiii) 195	
2-Jun-12	1187	187	187	
3-Jun-12	1200	192	192	
4-Jun-12	1167	212	212	
5-Jun-12	1182	215	215	
6-Jun-12	1183	229	229	
7-Jun-12	1200	234	234	
8-Jun-12	1175	226	226	
9-Jun-12	1185	Z25 Z45	245	
10-Jun-12		221	221	
	1144	219	219	
11-Jun-12	1138		39-12-3	
12-Jun-12	1200	223	223	
13-Jun-12	1153	181	181	
14-Jun-12	1192	195	195	
15-Jun-12	1183	174	174	
16-Jun-12	1163	236	236	
17-Jun-12	1188	234	234	
18-Jun-12	1165	213	213	
19-Jun-12	1142	168	168	
20-Jun-12	1175	197	197	
21-Jun-12	1188	243	243	
22-Jun-12	1160	211	211	
23-Jun-12	1163	176	176	
24-Jun-12	1183	186	186	
25-Jun-12	1167	204	204	
26-Jun-12	1183	170	170	
27-Jun-12	<b>√</b> 1213	165	165	
28-Jun-12	1170	166	166	
29-Jun-12	1188	231	231	
30-Jun-12	1200	228	228	



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Jun-12 Monthly Averages

Injection Pressure (psi)

1177

Injection Flow (gpm)

206

Return Flow (gpm)

206

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

27-Jun-12

1213

Minimum Injection Pressure and corresponding Injection Flow

Date 11-Jun-12 Injection Pressure (psi)

Injection Flow (gpm)

1138

219

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

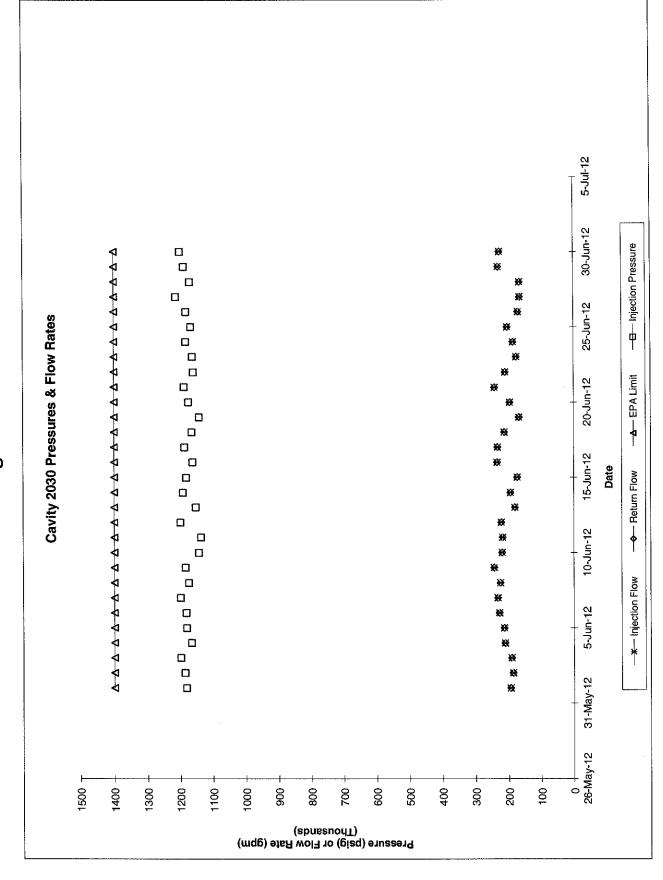
9-Jun-12

245

1185



JUL 2 0 2012



CAVITY 2040 /

#### Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
2 0.10	(psi)	(gpm)	(gpm)	
1-Jun-12	shut in	shut in	shut in	
2-Jun-12	shut in	shut in	shut in	
3-Jun-12	shut in	shut in	shut in	
4-Jun-12	shut in	shut in	shut in	
5-Jun-12	shut in	shut in	shut in	
6-Jun-12	shut in	shut in	shut in	
7-Jun-12	shut in	shut in	shut in	
8-Jun-12	shut in	shut in	shut in	
9-Jun-12	shut in	shut in	shut in	
10-Jun-12	shut in	shut in	shut in	
11-Jun-12	shut in	shut in	shut in	
12-Jun-12	shut in	shut in	shut in	
13-Jun-12	shut in	shut in	shut in	
14-Jun-12	shut in	shut in	shut in	
15-Jun-12	shut in	shut in	shut in	
16-Jun-12	shut in	shut in	shut in	
17-Jun-12	shut in	shut in	shut in	
18-Jun-12	shut in	shut in	shut in	
19-Jun-12	shut in	shut in	shut in	
20-Jun-12	shut in	shut in	shut in	
21-Jun-12	shut in	shut in	shut in	
22-Jun-12	shut in	shut in	shut in	
23-Jun-12	shut in	shut in	shut in	
24-Jun-12	shut in	shut in	shut in	
25-Jun-12	shut in	shut in	shut in	
26-Jun-12	shut in	shut in	shut in	
27-Jun-12	shut in	shut in	shut in	
28-Jun-12	shut in	shut in	shut in	
29-Jun-12	shut in	shut in	shut in	
30-Jun-12	shut in	shut in	shut in	



JUL 2 0 2012

## CAVITY 2061

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Cavity 2061

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Jun-12	1183	126	126
2-Jun-12	1180	131	131
3-Jun-12	1200	96	96
4-Jun-12	1167	97	97
5-Jun-12	1182	104	104
6-Jun-12	1183	110	110
7-Jun-12	1200	80	80
8-Jun-12	1175	107	107
9-Jun-12	1185	108	108
10-Jun-12	1144	107	107
11-Jun-12	1138	116	116
12-Jun-12	1200	79	79
13-Jun-12	1153	73	73
14-Jun-12	1158	104	104
15-Jun-12	1183	70	70
16-Jun-12	1163	81	81
17-Jun-12	1188	106	106
18-Jun-12	1165	96	96
19-Jun-12	1142	79	79
20-Jun-12	1175	108	108
21-Jun-12	1188	V142	142
22-Jun-12	1160	103	103
23-Jun-12	1163	128	128
24-Jun-12	1183	115	115
25-Jun-12	1175	116	116
26-Jun-12	1175	66	66
27-Jun-12	1213	93	93
28-Jun-12	1170	95	95
29-Jun-12	1188	77	77
30-Jun-12	1200	109	109



JUL 2 0 2012

Jun-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1176

101

101

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

27-Jun-12

1213

93

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

11-Jun-12

1138

116

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (psi)

Injection Pressure (psi)

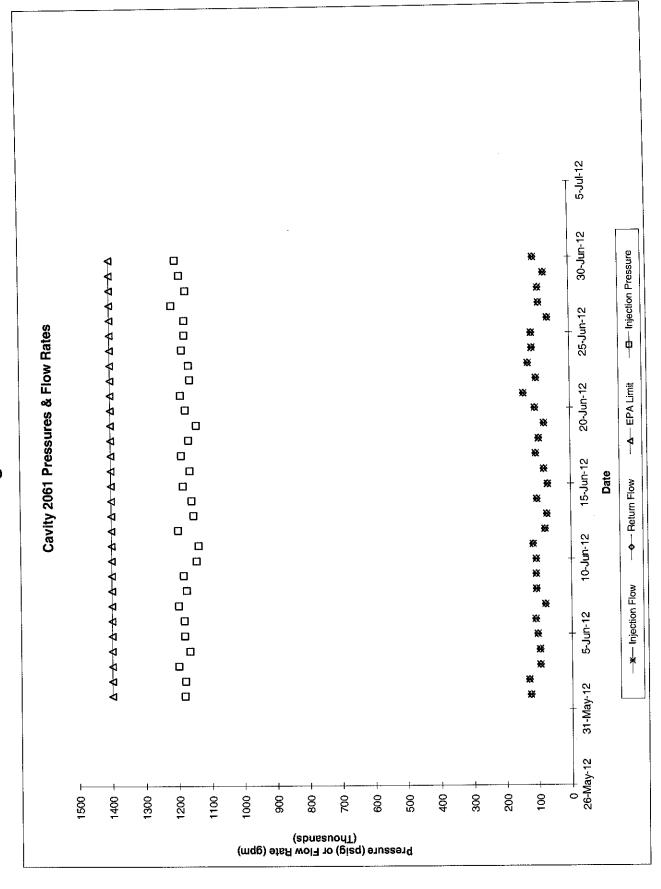
21-Jun-12

142

1188



JUL 2 0 2012





#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Jun-12	shut in	shut in	shut in
2-Jun-12	shut in	shut in	shut in
3-Jun-12	shut in	shut in	shut in
4-Jun-12	shut in	shut in	shut in
5-Jun-12	shut in	shut in	shut in
6-Jun-12	shut in	shut in	shut in
7-Jun-12	shut in	shut in	shut in
8-Jun-12	shut in	shut in	shut in
9-Jun-12	shut in	shut in	shut in
10-Jun-12	shut in	shut in	shut in
11-Jun-12	shut in	shut in	shut in
12-Jun-12	shut in	shut in	shut in
13-Jun-12	shut in	shut in	shut in
14-Jun-12	shut in	shut in	shut in
15-Jun-12	shut in	shut in	shut in
16-Jun-12	shut in	shut in	shut in
17-Jun-12	shut in	shut in	shut in
18-Jun-12	shut in	shut in	shut in
19-Jun-12	shut in	shut in	shut in
20-Jun-12	shut in	shut in	shut in
21-Jun-12	shut in	shut in	shut in
22-Jun-12	shut in	shut in	shut in
23-Jun-12	shut in	shut in	shut in
24-Jun-12	shut in	shut in	shut in
25-Jun-12	shut in	shut in	shut in
26-Jun-12	shut in	shut in	shut in
27-Jun-12	shut in	shut in	shut in
28-Jun-12	shut in	shut in	shut in
29-Jun-12	shut in	shut in	shut in
30-Jun-12	. shut in	shut in	shut in



JUL 2 0 2012



July 17, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU - 16J Chicago, IL 60604



JUL 2 0 2012

UIC BRANCH EPA, REGION 5

Lisa Perenchio Attn:

SUBJ. Second Quarter Report – Solution Mining Wells

For the period of April 1, 2012 – June 30, 2012

Permit No.: MI-133-3G-A002

- 1. Solution Mining operations from Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061, Cavity 2062 were conducted during the quarter.
- 2. Well re-work reports for all well workovers during the period were submitted under separate cover by Doug Patulski, Minefield Superintendent.
- 3. The flowrates to and from the solution mining wells are monitored continuously. The required quarterly well injection/return balance demonstrations for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062 are attached.
- 4. The fluid level in the injection zone is "at surface".
- 5. Attached are copies of the well fluid chemical analyses for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062.
- 6. Attached are the chemical analyses of the fluid samples obtained from the ground water monitoring wells.

The requirements of Part I (E)(10), Part II (B)(2) and Part III (C)(3) of Permit No. MI-133-3G-A002 are being met. The samples and measurements are representative of the monitoring activity and the analysis complies with the methods and procedures approved in the Waste Analysis Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please contact me at (231) 832-8800 if you have any questions.

Sincerely,

Doug Patulski

Minefield Superintendent

Attachments

Karl Tomaszewski

Site Manager

Quarterly Injection/Return Flow Balances

JUL 2 0 2012

			Total	Sand I de desde de		
	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
1-Apr-12	shut in	shut in	shut in	shut in	shut in	
2-Apr-12	shut in	shut in	shut in	shut in	shut in	
3-Apr-12	shut in	shut in	shut in	shut in	shut in	
4-Apr-12	shut in	shut in	shut in	shut in	shut in	
5-Apr-12	shut in	shut in	shut in	shut in	shut in	
6-Apr-12	shut in	shut in	shut in	shut in	shut in	
7-Apr-12	shut in	shut in	shut in	shut in	shut in	
8-Apr-12	shut in	shut in	shut in	shut in	shut in	
9-Apr-12	shut in	shut in	shut in	shut in	shut in	
10-Apr-12	shut in	shut in	shut in	shut in	shut in	
11-Apr-12	shut in	shut in	shut in	shut in	shut in	
12-Apr-12	shut in	shut in	shut in	shut in	shut in	
13-Apr-12	shut in	shut in	shut in	shut in	shut in	
14-Apr-12	shut in	shut in	shut in	shut in	shut in	
15-Apr-12	shut in	shut in	shut in	shut in	shut in	
16-Apr-12	shut in	shut in	shut in	shut in	shut in	
17-Apr-12	shut in	shut in	shut in	shut in	shut in	
18-Apr-12	shut in	shut in	shut in	shut in	shut in	
19-Apr-12	shut in	shut in	shut in	shut in	shut in	
20-Apr-12	shut in	shut in	shut in	shut in	shut in	
21-Apr-12	shut in	shut in	shut in	shut in	shut in	
22-Apr-12	shut in	shut in	shut in	shut in	shut in	
23-Apr-12	shut in	shut in	shut in	shut in	shut in	
24-Apr-12	shut in	shut in	shut in	shut in	shut in	
25-Apr-12	shut in	shut in	shut in	shut in	shut in	
26-Apr-12	shut in	shut in	shut in	shut in	shut in	
27-Apr-12	shut in	shut in	shut in	shut in	shut in	
28-Apr-12	shut in	shut in	shut in	shut in	shut in	
29-Apr-12	shut in	shut in	shut in	shut in	shut in	
30-Apr-12	shut in	shut in	shut in	shut in	shut in	
1-May-12	shut in	shut in	shut in	shut in	shut in	
2-May-12	shut in	shut in	shut in	shut in	shut in	
3-May-12	shut in	shut in	shut in	shut in	shut in	
4-May-12	shut in	shut in	shut in	shut in	shut in	
5-May-12	shut in	shut in	shut in	shut in	shut in	
6-May-12	shut in	shut in	shut in	shut in	shut in	
7-May-12	shut in	shut in	shut in	shut in	shut in	
8-May-12	shut in	shut in	shut in	shut in	shut in	
9-May-12	shut in	shut in	shut in	shut in	shut in	
10-May-12	shut in	shut in	shut in	shut in	shut in	
11-May-12	shut in	shut in	shut in	shut in	shut in	
12-May-12	shut in	shut in	shut in	shut in	shut in	
13-May-12	shut in	shut in	shut in	shut in	shut in	
14-May-12	shut in	shut in	shut in	shut in	shut in	
15-May-12	shut in	shut in	shut in	shut in	shut in	



JUL 2 0 2012

		•			•
16-May-12	shut in				
17-May-12	shut in				
18-May-12	shut in	shut in	shut in	shut in	shutin
19-May-12	shut in				
20-May-12	shut in				
21-May-12	shut in				
22-May-12	shut in				
23-May-12	shut in				
24-May-12	shut in				
25-May-12	shut in				
26-May-12	shut in				
27-May-12	shut in				
28-May-12	shut in				
29-May-12	shut in				
30-May-12	shut in				
31-May-12	shut in				
1-Jun-12	shut in				
2-Jun-12	shut in				
3-Jun-12	shut in				
4-Jun-12	shut in				
5-Jun-12	shut in				
6-Jun-12	shut in				
7-Jun-12	shut in				
8-Jun-12	shut in				
9-Jun-12	shut in				
10-Jun-12	shut in				
11-Jun-12	shut in				
12-Jun-12	shut in				
13-Jun-12	shut in				
14-Jun-12	shut in				
15-Jun-12	shut in				
16-Jun-12	shut in				
17-Jun-12	shut in				
18-Jun-12	shut in				
19-Jun-12	shut in				
20-Jun-12	shut in				
21-Jun-12	shut in				
22-Jun-12	shut in				
23-Jun-12	shut in				
24-Jun-12	shut in				
25-Jun-12	shut in				
26-Jun-12	shut in				
27-Jun-12	shut in				
28-Jun-12	shut in				
29-Jun-12	shut in				
30-Jun-12	shut in				
Averages	shut in				

	Total				
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Apr-12	251	0.0	251	255	0.98
2-Apr-12	294	4.0	298	312	0.96
3-Apr-12	308	4.8	313	310	1.01
4-Apr-12	339	5.8	345	333	1.04
5-Apr-12	79	0.0	79	81	0.98
6-Apr-12	216	4.0	220	213	1.03
7-Apr-12	331	4.1	335	314	1.07
8-Apr-12	339	4.5	344	346	0.99
9-Apr-12	80	0.9	81	74	1.09
10-Apr-12	shut in	shut in	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in	shut in	shut in
1-May-12	shut in	shut in	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in	shut in	shut in
7-May-12	220	6.6	227	220	1.03
8-May-12	241	6.7	248	258	0.96
9-May-12	230	6.6	237	257	0.92
10-May-12	228	6.4	234	255	0.92
11-May-12	220	4.9	225	236	0.95
12-May-12	226	6.0	232	255	0.91
13-May-12	245	5.5	251	274	0.91
14-May-12	249	5.8	255	275	0.93
15-May-12	240	4.8	245	266	0.92
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16-May-12	376	4.7	381	121	3.15
17-May-12	119	4.9	124	407	0.30
18-May-12	201	4.0	205	223	0.92
19-May-12	248	5.0	253	269	0.94
20-May-12	245	0.0	245	269	0.91
21-May-12	234	5.2	239	255	0.94
22-May-12	238	4.8	243	249	0.98
23-May-12	228	4.5	233	266	0.87
24-May-12	247	5.3	252	272	0.93
25-May-12	279	4.7	284	320	0.89
26-May-12	278	4.7	283	308	0.92
27-May-12	296	6.3	302	661	0.46
28-May-12	268	5.6	274	289	0.95
29-May-12	266	6.1	272	292	0.93
30-May-12	269	5.6	275	305	0.90
31-May-12	305	5.5	311	334	0.93
1-Jun-12	250	4.8	255	286	0.89
2-Jun-12	297	4.2	301	319	0.94
3-Jun-12	292	4.6	297	320	0.93
4-Jun-12	291	3.9	295	326	0.90
5-Jun-12	319	3.9	323	350	0.92
6-Jun-12	299	1.8	301	324	0.93
7-Jun-12	341	4.8	346	310	1.12
8-Jun-12	308	5.2	313	337	0.93
9-Jun-12	291	5.1	296	339	0.87
10-Jun-12	327	5.0	332	341	0.97
11-Jun-12	323	4.9	328	347	0.94
12-Jun-12	313	5.0	318	345	0.92
13-Jun-12	301	4.9	306	333	0.92
14-Jun-12	317	5.5	323	354	0.91
15-Jun-12	shut in				
16-Jun-12	shut in				
17-Jun-12	shut in				
18-Jun-12	shut in				
19-Jun-12	shut in				
20-Jun-12	shut in				
21-Jun-12	shut in				
22-Jun-12	shut in				
23-Jun-12	shut in				
24-Jun-12	290	4.9	295	301	0.98
25-Jun-12	306	5.4	311	318	0.98
26-Jun-12	266	5.7	272	314	0.87
27-Jun-12	307	4.9	312	318	0.98
28-Jun-12	328	4.0	332	339	0.98
29-Jun-12	337	4.9	342	368	0.93
30-Jun-12	240	4.8	245	235	1.04
Averages	269	4.7	274	295	0.97

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
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1-Apr-12	shut in	shut in	shut in	shut in	shut in
2-Apr-12	shut in	shut in	shut in	shut in	shut in
3-Apr-12	shut in	shut in	shut in	shut in	shut in
4-Apr-12	shut in	shut in	shut in	shut in	shut in
5-Apr-12	shut in	shut in	shut in	shut in	shut in
6-Apr-12	shut in	shut in	shut in	shut in	shut in
7-Apr-12	shut in	shut in	shut in	shut in	shut in
8-Apr-12	shut in	shut in	shut in	shut in	shut in
9-Apr-12	shut in	shut in	shut in	shut in	shut in
10-Apr-12	shut in	shut in	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in	shut in	shut in
1-May-12	shut in	shut in	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in	shut in	shut in
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8-May-12	shut in	shut in	shut in	shut in	shut in
9-May-12	shut in	shut in	shut in	shut in	shut in
10-May-12	shut in	shut in	shut in	shut in	shut in
11-May-12	shut in	shut in	shut in	shut in	shut in
12-May-12	shut in	shut in	shut in	shut in	shut in
13-May-12	shut in	shut in	shut in	shut in	shut in
14-May-12	shut in	shut in	shut in	shut in	shut in
15-May-12	shut in	shut in	shut in	shut in	shut in
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16-May-12	shut in				
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27-Jun-12	shut in				
28-Jun-12	shut in				
29-Jun-12	shut in				
30-Jun-12	shut in				
Averages	shut in				

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Apr-12	139	0.0	139	139	1.00
2-Apr-12	170	3.2	173	170	1.02
3-Apr-12	193	4.6	198	193	1.02
4-Apr-12	182	4.4	186	182	1.02
5-Apr-12	90	0.0	90	90	1.00
6-Apr-12	116	5.2	121	116	1.04
7-Apr-12	130	5.0	135	130	1.04
8-Apr-12	146	4.7	151	146	1.03
9-Apr-12	147	2.7	150	147	1.02
10-Apr-12	150	3.3	153	150	1.02
11-Apr-12	145	3.8	149	145	1.03
12-Apr-12	152	4.0	156	152	1.03
13-Apr-12	71	0.0	71	71	1.00
14-Apr-12	153	4.9	158	153	1.03
15-Apr-12	205	4.7	210	205	1.02
16-Apr-12	209	5.0	214	209	1.02
17-Apr-12	205	5.0	210	205	1.02
18-Apr-12	209	4.9	214	209	1.02
19-Apr-12	208	5.0	213	208	1.02
20-Apr-12	144	2.5	147	144	1.02
21-Apr-12	112	5.4	117	112	1.05
22-Apr-12	229	5.3	234	229	1.02
23-Apr-12	216	5.0	221	216	1.02
24-Apr-12	219	5.1	224	219	1.02
25-Apr-12	159	5.1	164	159	1.03
26-Apr-12	128	4.9	133	128	1.04
27-Apr-12	180	4.2	184	180	1.02
28-Apr-12	158	5.0	163	158	1.03
29-Apr-12	144	5.3	149	144	1.04
30-Apr-12	144	5.7	150	144	1.04
1-May-12	145	6.0	151	145	1.04
2-May-12	179	4.6	184	179	1.03
3-May-12	160	3.4	163	160	1.02
4-May-12	157	5.3	162	157	1.03
5-May-12	157	5.3	162	157	1.03
6-May-12	144	5.1	149	144	1.04
7-May-12	180	5.2	185	180	1.03
8-May-12	206	6.0	212	206	1.03
9-May-12	153	5.9	159	153	1.04
10-May-12	142	5.6	148	142	1.04
11-May-12	147	0.0	147	147	1.00
12-May-12	166	4.1	170	166	1.02
13-May-12	190	2.9	193	190	1.02
14-May-12	165	3.8	169	165	1.02
15-May-12	153	4.6	158	153	1.03
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16-May-12	144	4.0	148	144	1.03
17-May-12	180	3.9	184	180	1.02
18-May-12	142	3.6	146	142	1.03
19-May-12	149	4.3	153	149	1.03
20-May-12	133	0.0	133	133	1.00
21-May-12	156	6.6	163	156	1.04
22-May-12	142	5.2	147	142	1.04
23-May-12	141	3.3	144	141	1.02
24-May-12	155	3.7	159	155	1.02
25-May-12	220	3.4	223	220	1.02
26-May-12	198	3.9	202	198	1.02
27-May-12	171	4.1	175	171	1.02
28-May-12	142	4.6	147	142	1.03
29-May-12	149	4.9	154	149	1.03
30-May-12	158	5.6	164	158	1.04
31-May-12	176	5.6	182	176	1.03
1-Jun-12	155	4.5	160	155	1.03
2-Jun-12	154	0.0	154	154	1.00
3-Jun-12	160	6.0	166	160	1.04
4-Jun-12	149	4.0	153	149	1.03
5-Jun-12	169	4.0	173	169	1.02
6-Jun-12	149	1.8	151	149	1.01
7-Jun-12	157	4.4	161	157	1.03
8-Jun-12	174	3.4	177	174	1.02
9-Jun-12	147	3.3	150	147	1.02
10-Jun-12	144	2.9	147	144	1.02
11-Jun-12	128	4.6	133	128	1.04
12-Jun-12	163	5.2	168	163	1.03
13-Jun-12	148	5.1	153	148	1.03
14-Jun-12	162	5.3	167	162	1.03
15-Jun-12	151	5.1	156	151	1.03
16-Jun-12	137	4.6	142	137	1.03
17-Jun-12	170	4.0	174	170	1.02
18-Jun-12	148	5.9	154	148	1.04
19-Jun-12	188	4.8	193	188	1.03
20-Jun-12	143	4.0	147	143	1.03
21-Jun-12	167	4.4	171	167	1.03
22-Jun-12	156	4.0	160	156	1.03
23-Jun-12	144	0.0	144	144	1.00
24-Jun-12	159	5.3	164	159	1.03
25-Jun-12	157	5.8	163	157	1.04
26-Jun-12	151	4.8	156	151	1.03
27-Jun-12	169	5.0	174	169	1.03
28-Jun-12	156	4.9	161	156	1.03
29-Jun-12	140	5.3	145	140	1.04
30-Jun-12	127	5.8	133	127	1.05
Averages	159	4.2	164	159	1.03

Date   Flow				Total		
Date		Injection	Dilution		Return	Ratio
2-Apr-12 shut in shut	Date	•		•		
2-Apr-12 shut in shut	4.1					
3-Apr-12 shut in shut	·					
4-Apr-12         shut in						
5-Apr-12         shut in         <	•					
6-Apr-12 shut in shut in shut in shut in shut in shut in 7-Apr-12 shut in shut						
7-Apr-12 shut in shut	· ·					
8-Apr-12 shut in shut in shut in shut in 9-Apr-12 295 5.5 301 302 1.00 10-Apr-12 295 5.5 301 302 1.00 11-Apr-12 295 5.9 298 280 1.06 11-Apr-12 285 7.0 292 282 1.04 12-Apr-12 285 7.4 292 314 0.93 13-Apr-12 319 0.0 319 305 1.05 14-Apr-12 333 6.2 339 355 0.96 15-Apr-12 347 6.7 354 388 0.91 16-Apr-12 375 6.0 381 394 0.97 17-Apr-12 388 5.3 373 384 0.97 17-Apr-12 368 5.2 373 380 0.98 19-Apr-12 361 5.3 366 372 0.98 19-Apr-12 299 5.5 305 291 1.05 22-Apr-12 299 6.9 306 292 1.05 22-Apr-12 364 6.6 361 391 0.92 23-Apr-12 368 5.2 373 393 0.95 22-Apr-12 364 6.6 361 391 0.92 23-Apr-12 365 5.2 373 393 0.95 22-Apr-12 366 5.2 373 393 0.95 22-Apr-12 364 6.6 361 391 0.92 23-Apr-12 365 5.2 373 393 0.95 22-Apr-12 366 5.2 373 393 0.95 22-Apr-12 366 5.2 374 0.97 25-Apr-12 366 5.2 381 391 0.99 25-Apr-12 366 5.2 381 391 0.99 25-Apr-12 366 5.2 381 391 0.99 25-Apr-12 366 5.3 366 360 1.00 27-Apr-12 364 5.8 360 360 1.00 28-Apr-12 375 6.5 382 383 1.00 27-Apr-12 364 5.8 360 360 1.00 28-Apr-12 364 5.9 366 366 368 1.00 30-Apr-12 366 5.4 366 366 0.99 3-May-12 347 3.1 350 350 1.00 4-May-12 347 3.1 350 350 1.00 4-May-12 347 6.1 353 370 0.95 3-May-12 347 6.1 350 350 350 1.00 3-May-12 347 6.1 353 370 0.95 3-May-12 347 6.1 350 350 350 1.00 3-May-12 347 6.1 353 370 0.95 3-May-12 347 6.1 350 350 350 350 1.00 3-May-12 347 6.1 350 350 350 350 1.00 3-May-12 347 341 350 350 350 350 350 350 350 350 350 350	•					
9-Apr-12	•					
10-Apr-12 292 5.9 298 280 1.06 11-Apr-12 285 7.0 292 282 1.04 112-Apr-12 285 7.4 292 314 0.93 13-Apr-12 319 0.0 319 305 1.05 14-Apr-12 333 6.2 339 355 0.96 15-Apr-12 347 6.7 354 388 0.91 16-Apr-12 375 6.0 381 394 0.97 17-Apr-12 368 5.2 373 384 0.97 17-Apr-12 368 5.2 373 380 0.98 19-Apr-12 361 5.3 366 372 0.98 19-Apr-12 361 5.3 366 372 0.98 19-Apr-12 299 5.5 305 291 1.05 21-Apr-12 354 6.6 361 391 0.92 21-Apr-12 354 6.6 361 391 0.92 22-Apr-12 354 6.6 361 391 0.92 23-Apr-12 368 5.2 373 393 0.95 24-Apr-12 368 5.2 373 393 0.95 24-Apr-12 354 6.6 361 391 0.92 25-Apr-12 354 6.6 361 391 0.92 26-Apr-12 355 6.2 381 391 0.97 25-Apr-12 361 0.8 362 374 0.97 26-Apr-12 361 0.8 362 374 0.97 26-Apr-12 361 5.4 366 360 360 1.00 27-Apr-12 354 5.8 366 368 1.00 30-Apr-12 354 5.9 354 1.01 29-Apr-12 361 5.4 366 368 1.00 30-Apr-12 354 5.8 366 368 1.00 30-Apr-12 354 5.9 354 1.01 29-Apr-12 361 5.4 366 368 1.00 30-Apr-12 354 5.9 359 354 1.01 29-Apr-12 361 5.4 366 368 1.00 30-Apr-12 354 5.9 359 354 1.01 29-Apr-12 361 5.4 366 368 1.00 30-Apr-12 354 5.9 359 354 1.01 29-Apr-12 361 5.4 366 368 1.00 30-Apr-12 351 5.3 338 341 0.99 3-May-12 347 4.9 352 375 0.94 3-May-12 347 3.1 350 350 350 1.00 4-May-12 347 5.1 350 350 350 1.00 4-May-12 347 6.1 353 370 0.95 7-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 345 349 0.99 6-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 340 5.0 3	•					
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13-Apr-12 319 0.0 319 305 1.05 14-Apr-12 333 6.2 339 355 0.96 15-Apr-12 347 6.7 354 388 0.91 16-Apr-12 375 6.0 381 394 0.97 17-Apr-12 368 5.3 373 384 0.97 17-Apr-12 368 5.2 373 380 0.98 19-Apr-12 361 5.3 366 372 0.98 19-Apr-12 299 5.5 305 291 1.05 22-Apr-12 299 6.9 306 292 1.05 22-Apr-12 354 6.6 361 391 0.92 23-Apr-12 368 5.2 373 393 0.95 24-Apr-12 368 5.2 373 393 0.95 25-Apr-12 354 6.6 361 391 0.92 25-Apr-12 355 6.2 381 391 0.97 25-Apr-12 375 6.2 381 391 0.97 25-Apr-12 361 0.8 362 374 0.97 26-Apr-12 354 5.8 360 360 1.00 27-Apr-12 354 5.8 360 360 1.00 28-Apr-12 354 5.8 360 360 1.00 30-Apr-12 354 5.8 360 368 1.00 30-Apr-12 354 5.8 360 360 1.00 30-Apr-12 354 5.8 360 368 1.00 30-Apr-12 354 5.9 355 5.8 360 368 1.00 30-Apr-12 347 4.9 352 375 0.94 3-May-12 347 3.1 350 350 350 1.00 4-May-12 347 3.1 350 350 350 1.00 4-May-12 347 3.1 350 350 350 1.00 4-May-12 347 3.1 350 350 350 1.00 5-May-12 347 3.1 350 350 300 0.95 6-May-12 347 6.1 353 370 0.95 6-May-12 347 6.1 353 370 0.95 6-May-12 340 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.	•					
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15-Apr-12         347         6.7         354         388         0.91           16-Apr-12         375         6.0         381         394         0.97           17-Apr-12         368         5.3         373         384         0.97           18-Apr-12         368         5.2         373         380         0.98           19-Apr-12         361         5.3         366         372         0.98           20-Apr-12         299         5.5         305         291         1.05           21-Apr-12         299         6.9         306         292         1.05           22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           25-Apr-12         361         0.8         362         374         0.97           25-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354 <td< td=""><td>•</td><td></td><td></td><td></td><td></td><td></td></td<>	•					
16-Apr-12         375         6.0         381         394         0.97           17-Apr-12         368         5.3         373         384         0.97           18-Apr-12         368         5.2         373         380         0.98           19-Apr-12         361         5.3         366         372         0.98           20-Apr-12         299         5.5         305         291         1.05           22-Apr-12         299         6.9         306         292         1.05           22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         364         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361 <td< td=""><td>•</td><td></td><td></td><td></td><td></td><td></td></td<>	•					
17-Apr-12 368 5.3 373 384 0.97 18-Apr-12 368 5.2 373 380 0.98 19-Apr-12 361 5.3 366 372 0.98 20-Apr-12 299 5.5 305 291 1.05 21-Apr-12 354 6.6 361 391 0.92 22-Apr-12 3568 5.2 373 393 0.95 24-Apr-12 368 5.2 373 393 0.95 24-Apr-12 368 5.2 373 393 0.95 24-Apr-12 375 6.2 381 391 0.97 25-Apr-12 361 0.8 362 374 0.97 25-Apr-12 354 5.8 360 360 1.00 27-Apr-12 375 6.5 382 363 1.00 28-Apr-12 354 5.8 360 360 1.00 28-Apr-12 354 5.8 360 360 1.00 28-Apr-12 354 5.8 360 360 1.00 30-Apr-12 354 5.8 360 360 1.00 30-Apr-12 354 5.8 360 360 9.90 30-Apr-12 361 5.4 366 368 1.00 30-Apr-12 361 5.4 366 368 361 0.99 2-May-12 347 4.9 352 375 0.94 3-May-12 347 3.1 350 350 1.00 4-May-12 368 5.4 373 363 1.03 5-May-12 368 5.4 373 363 370 0.95 7-May-12 347 6.1 353 370 0.95 7-May-12 340 5.0 5.4 5.4 5.5 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8 5.8						
18-Apr-12         368         5.2         373         380         0.98           19-Apr-12         361         5.3         366         372         0.98           20-Apr-12         299         5.5         305         291         1.05           21-Apr-12         299         6.9         306         292         1.05           22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         368         5.2         373         393         0.95           24-Apr-12         361         0.8         362         374         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333 <td< td=""><td>T .</td><td></td><td></td><td></td><td></td><td></td></td<>	T .					
19-Apr-12	•					
20-Apr-12         299         5.5         305         291         1.05           21-Apr-12         299         6.9         306         292         1.05           22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         375         6.5         382         383         1.00           28-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.8         360         360         1.00           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           1-May-12         340         5.0         345         349         0.99           2-May-12         347         4	•					
21-Apr-12         299         6.9         306         292         1.05           22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           1-May-12         340         5.0         345         349         0.99           2-May-12         347         4.9         352         375         0.94           3-May-12         347         3.1         350         350         1.00           4-May-12         368         5.4	•					
22-Apr-12         354         6.6         361         391         0.92           23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           2-May-12         340         5.0         345         349         0.99           2-May-12         347         4.9         352         375         0.94           3-May-12         347         3.1         350         350         1.00           4-May-12         368         5.4	•					
23-Apr-12         368         5.2         373         393         0.95           24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           1-May-12         340         5.0         345         349         0.99           1-May-12         347         4.9         352         375         0.94           3-May-12         347         3.1         350         350         1.00           4-May-12         368         5.4         373         363         1.03           5-May-12         355         5.8<	•					
24-Apr-12         375         6.2         381         391         0.97           25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           1-May-12         340         5.0         345         349         0.99           2-May-12         347         4.9         352         375         0.94           3-May-12         347         3.1         350         350         1.00           4-May-12         368         5.4         373         363         1.03           5-May-12         355         5.8         361         366         0.99           6-May-12         347         6.1         353         370         0.95           7-May-12         shut in         sh						
25-Apr-12         361         0.8         362         374         0.97           26-Apr-12         375         6.5         382         383         1.00           27-Apr-12         354         5.8         360         360         1.00           28-Apr-12         354         5.2         359         354         1.01           29-Apr-12         361         5.4         366         368         1.00           30-Apr-12         333         5.3         338         341         0.99           1-May-12         340         5.0         345         349         0.99           2-May-12         347         4.9         352         375         0.94           3-May-12         347         3.1         350         350         1.00           4-May-12         368         5.4         373         363         1.03           5-May-12         355         5.8         361         366         0.99           6-May-12         347         6.1         353         370         0.95           7-May-12         3tu in         shut	•					
26-Apr-12       375       6.5       382       383       1.00         27-Apr-12       354       5.8       360       360       1.00         28-Apr-12       354       5.2       359       354       1.01         29-Apr-12       361       5.4       366       368       1.00         30-Apr-12       333       5.3       338       341       0.99         1-May-12       340       5.0       345       349       0.99         1-May-12       347       4.9       352       375       0.94         3-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       347       6.1       353       370       0.95         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in       shut in         10-May-12       <	·					
27-Apr-12       354       5.8       360       360       1.00         28-Apr-12       354       5.2       359       354       1.01         29-Apr-12       361       5.4       366       368       1.00         30-Apr-12       333       5.3       338       341       0.99         1-May-12       340       5.0       345       349       0.99         2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       347       6.1       353       370       0.95         8-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in         10-May-12       shut in <t< td=""><td>•</td><td></td><td></td><td></td><td></td><td></td></t<>	•					
28-Apr-12       354       5.2       359       354       1.01         29-Apr-12       361       5.4       366       368       1.00         30-Apr-12       333       5.3       338       341       0.99         1-May-12       340       5.0       345       349       0.99         2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       3hut in	•					
29-Apr-12       361       5.4       366       368       1.00         30-Apr-12       333       5.3       338       341       0.99         1-May-12       340       5.0       345       349       0.99         2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in       shut in         10-May-12       shut in         12-May-12       shut in         14-May-12       shut in       shut in       shut in       shut in       shut in       shut in <td>•</td> <td></td> <td></td> <td></td> <td></td> <td></td>	•					
30-Apr-12       333       5.3       338       341       0.99         1-May-12       340       5.0       345       349       0.99         2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in         10-May-12       shut in         12-May-12       shut in         13-May-12       shut in       shut in       shut in       shut in       shut in       shut in         14-May-12       shut in       shut in       shut in       shut in	· ·					
1-May-12       340       5.0       345       349       0.99         2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in         9-May-12       shut in       shut in       shut in       shut in       shut in       shut in         11-May-12       shut in       shut in       shut in       shut in       shut in       shut in         13-May-12       shut in       shut in       shut in       shut in       shut in       shut in         14-May-12       shut in       shut in       shut in       shut in       shut in	· ·					
2-May-12       347       4.9       352       375       0.94         3-May-12       347       3.1       350       350       1.00         4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in         9-May-12       shut in       shut in       shut in       shut in       shut in         10-May-12       shut in       shut in       shut in       shut in       shut in         11-May-12       shut in       shut in       shut in       shut in       shut in         13-May-12       shut in       shut in       shut in       shut in       shut in         14-May-12       shut in       shut in       shut in       shut in       shut in	30-Apr-12			338		
3-May-12     347     3.1     350     350     1.00       4-May-12     368     5.4     373     363     1.03       5-May-12     355     5.8     361     366     0.99       6-May-12     347     6.1     353     370     0.95       7-May-12     111     2.2     113     122     0.93       8-May-12     shut in     shut in     shut in     shut in     shut in       9-May-12     shut in     shut in     shut in     shut in     shut in       10-May-12     shut in     shut in     shut in     shut in     shut in       11-May-12     shut in     shut in     shut in     shut in     shut in       13-May-12     shut in     shut in     shut in     shut in     shut in       14-May-12     shut in     shut in     shut in     shut in			5.0			
4-May-12       368       5.4       373       363       1.03         5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in       shut in         9-May-12       shut in       shut in       shut in       shut in       shut in       shut in         10-May-12       shut in       shut in       shut in       shut in       shut in       shut in         12-May-12       shut in       shut in       shut in       shut in       shut in       shut in         13-May-12       shut in       shut in       shut in       shut in       shut in       shut in         14-May-12       shut in       shut in       shut in       shut in       shut in       shut in		347	4.9	352	375	0.94
5-May-12       355       5.8       361       366       0.99         6-May-12       347       6.1       353       370       0.95         7-May-12       111       2.2       113       122       0.93         8-May-12       shut in       shut in       shut in       shut in       shut in         9-May-12       shut in       shut in       shut in       shut in       shut in         10-May-12       shut in       shut in       shut in       shut in       shut in         11-May-12       shut in       shut in       shut in       shut in       shut in         13-May-12       shut in       shut in       shut in       shut in       shut in         14-May-12       shut in       shut in       shut in       shut in       shut in	3-May-12	347	3.1	350	350	1.00
6-May-12 347 6.1 353 370 0.95 7-May-12 111 2.2 113 122 0.93 8-May-12 shut in shut in shut in shut in shut in shut in 9-May-12 shut in shut in shut in shut in shut in shut in 10-May-12 shut in shut in shut in shut in shut in shut in 11-May-12 shut in shut in shut in shut in shut in shut in 12-May-12 shut in sh	4-May-12	368	5.4	373	363	1.03
7-May-12 111 2.2 113 122 0.93 8-May-12 shut in 10-May-12 shut in shut	5-May-12	355	5.8	361	366	0.99
8-May-12 shut in	6-May-12	347	6.1	353	370	0.95
9-May-12 shut in	7-May-12	111	2.2	113	122	0.93
10-May-12 shut in	8-May-12	shut in	shut in	shut in	shut in	shut in
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·	-				shut in	shut in
TO May 12 SHULTH SHULTH SHULTH SHULTH	15-May-12	shut in	shut in	shut in	shut in	shut in

16-May-12	shut in				
17-May-12	shut in				
18-May-12	shut in				
19-May-12	shut in				
20-May-12	shut in				
21-May-12	shut in				
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29-May-12	shut in				
30-May-12	shut in				
31-May-12	shut in				
1-Jun-12	shut in				
2-Jun-12	shut in				
3-Jun-12	shut in				
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9-Jun-12	shut in				
10-Jun-12	shut in				
11-Jun-12	shut in				
12-Jun-12	shut in				
13-Jun-12	shut in				
14-Jun-12	shut in				
15-Jun-12	shut in				
16-Jun-12	340	4.8	345	337	1.02
17-Jun-12	340	5.4	345	343	1.01
18-Jun-12	326	5.3	331	344	0.96
19-Jun-12	313	5.7	319	290	1.10
20-Jun-12	299	0.0	299	304	0.98
21-Jun-12	306	6.1	312	318	0.98
22-Jun-12	326	6.0	332	341	0.97
23-Jun-12	125	0.0	125	135	0.93
24-Jun-12	shut in				
25-Jun-12	shut in				
26-Jun-12	shut in				
27-Jun-12	shut in				
28-Jun-12	shut in				
29-Jun-12	shut in				
30-Jun-12	shut in				

331

5.0

Averages

326

335

0.99

			Total		
_	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Apr-12	216	0.0	216	216	1.00
2-Apr-12	241	0.0	241	241	1.00
3-Apr-12	232	0.0	232	232	1.00
4-Apr-12	203	0.0	203	203	1.00
5-Apr-12	277	0.0	277	277	1.00
6-Apr-12	308	0.0	308	308	1.00
7-Apr-12	294	0.0	294	294	1.00
8-Apr-12	292	0.0	292	292	1.00
9-Apr-12	269	0.0	269	269	1.00
10-Apr-12	259	0.0	259	259	1.00
11-Apr-12	264	0.0	264	264	1.00
12-Apr-12	286	0.0	286	286	1.00
13-Apr-12	306	0.0	306	306	1.00
14-Apr-12	318	0.0	318	318	1.00
15-Apr-12	249	0.0	249	249	1.00
16-Apr-12	265	0.0	265	265	1.00
17-Apr-12	272	0.0	272	272	1.00
18-Apr-12	288	0.0	288	288	1.00
19-Apr-12	236	0.0	236	236	1.00
20-Apr-12	241	0.0	241	241	1.00
21-Apr-12	234	0.0	234	234	1.00
22-Apr-12	293	0.0	293	293	1.00
23-Apr-12	268	0.0	268	268	1.00
24-Apr-12	151	0.0	151	151	1.00
25-Apr-12	280	0.0	280	280	1.00
26-Apr-12	248	0.0	248	248	1.00
27-Apr-12	271	0.0	271	271	1.00
28-Apr-12	194	0.0	194	194	1.00
29-Apr-12	219	0.0	219	219	1.00
30-Apr-12	182	0.0	182	182	1.00
1-May-12	232	0.0	232	232	1.00
2-May-12	172	0.0	172	172	1.00
3-May-12	190	0.0	190	190	1.00
4-May-12	226	0.0	226	226	1.00
5-May-12	169	0.0	169	169	1.00
6-May-12	225	0.0	225	225	1.00
7-May-12	238	0.0	238	238	1.00
8-May-12	244	0.0	244	244	1.00
9-May-12	260	0.0	260	260	1.00
10-May-12	247	0.0	247	247	1.00
11-May-12	202	0.0	202	202	1.00
12-May-12	228	0.0	228	228	1.00
13-May-12	235	0.0	235	235	1.00
14-May-12	238	0.0	238	238	1.00
15-May-12	195	0.0	195	195	1.00

			•		
16-May-12	220	0.0	220	220	1.00
17-May-12	247	0.0	247	247	1.00
18-May-12	211	0.0	211	211	1.00
19-May-12	241	0.0	241	241	1.00
20-May-12	240	0.0	240	240	1.00
21-May-12	231	0.0	231	231	1.00
22-May-12	254	0.0	254	254	1.00
23-May-12	208	16.0	224	208	1.08
24-May-12	229	20.8	250	229	1.09
25-May-12	<b>17</b> 7	0.0	177	177	1.00
26-May-12	235	0.0	235	235	1.00
27-May-12	250	0.0	250	250	1.00
28-May-12	215	0.0	215	215	1.00
29-May-12	222	0.0	222	222	1.00
30-May-12	257	0.0	257	257	1.00
31-May-12	226	0.0	226	226	1.00
1-Jun-12	195	0.0	195	195	1.00
2-Jun-12	187	0.0	187	187	1.00
3-Jun-12	.192	0.0	192	192	1.00
4-Jun-12	212	0.0	212	212	1.00
5-Jun-12	215	0.0	215	215	1.00
6-Jun-12	229	0.0	229	229	1.00
7-Jun-12	234	0.0	234	234	1.00
8-Jun-12	226	0.0	226	226	1.00
9-Jun-12	245	0.0	245	245	1.00
10-Jun-12	221	0.0	221	221	1.00
11-Jun-12	219	0.0	219	219	1.00
12-Jun-12	223	0.0	223	223	1.00
13-Jun-12	181	0.0	181	181	1.00
14-Jun-12	195	0.0	195	195	1.00
15-Jun-12	174	0.0	174	174	1.00
16-Jun-12	236	0.0	236	236	1.00
17-Jun-12	234	0.0	234	234	1.00
18-Jun-12	213	0.0	213	213	1.00
19-Jun-12	168	0.0	168	168	1.00
20-Jun-12	197	0.0	197	197	1.00
21-Jun-12	243	0.0	243	243	1.00
22-Jun-12	211	0.0	211	211	1.00
23-Jun-12	176	0.0	176	176	1.00
24-Jun-12	186	0.0	186	186	1.00
25-Jun-12	204	0.0	204	204	1.00
26-Jun-12	170	0.0	170	170	1.00
27-Jun-12	165	0.0	165	165	1.00
28-Jun-12	166	0.0	166	166	1.00
29-Jun-12	231	0.0	231	231	1.00
30-Jun-12	228	0.0	228	228	1.00
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Averages	229	0.4	229	229	1.00

Total	Return R	
Injection Dilution Injection		atio
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6-Apr-12 shut in shut in shut in	shut in sh	iut in
7-Apr-12 shut in shut in shut in	shut in sh	ut in
8-Apr-12 shut in shut in shut in	shut in sh	iut in
9-Apr-12 shut in shut in shut in	shut in sh	ut in
10-Apr-12 shut in shut in shut in	shut in sh	iut in
11-Apr-12 shut in shut in shut in	shut in sh	nut in
12-Apr-12 shut in shut in shut in	shut in sh	nut in
13-Apr-12 shut in shut in shut in	shut in sh	nut in
14-Apr-12 shut in shut in shut in	shut in sh	rut in
15-Apr-12 shut in shut in shut in	shut in sh	nut in
16-Apr-12 shut in shut in shut in	shut in sh	iut in
17-Apr-12 shut in shut in shut in	shut in sh	nut in
18-Apr-12 shut in shut in shut in	shut in sh	nut in
19-Apr-12 shut in shut in shut in	shut in sh	nut in
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17-May-12	shut in				
18-May-12	shut in				
19-May-12	shut in				
20-May-12	shut in				
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24-May-12	shut in				
25-May-12	shut in				
26-May-12	shut in				
27-May-12	shut in				
28-May-12	shut in				
29-May-12	shut in				
30-May-12	shut in				
31-May-12	shut in				
1-Jun-12	shut in				
2-Jun-12	shut in				
3-Jun-12	shut in				
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9-Jun-12	shut in				
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14-Jun-12	shut in				
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18-Jun-12	shut in				
19-Jun-12	shut in				
20-Jun-12	shut in				
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25-Jun-12	shut in				
26-Jun-12	shut in				
27-Jun-12	shut in				
28-Jun-12	shut in				
29-Jun-12	shut in				
30-Jun-12	shut in				
Averages	shut in				

	1.2	<b>5</b> 2. 0	Total	<b>D</b>	Dotio	
Date	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
1-Apr-12	121	0.0	121	121	1.00	
2-Apr-12	60	0.0	60	60	1.00	
3-Apr-12	18	0.0	18	18	1.00	
4-Apr-12	shut in	shut in	shut in	shut in	shut in	
5-Apr-12	193	0.0	193	193	1.00	
6-Apr-12	216	0.0	216	216	1.00	
7-Apr-12	98	0.0	98	98	1.00	
8-Apr-12	99	0.0	99	99	1.00	
9-Apr-12	125	0.0	125	125	1.00	
10-Apr-12	99	0.0	99	99	1.00	
11-Apr-12	116	0.0	116	116	1.00	
12-Apr-12	62	0.0	62	62	1.00	
13-Apr-12	51	0.0	51	51	1.00	
14-Apr-12	shut in	shut in	shut in	shut in	shut in	
15-Apr-12	109	0.0	109	109	1.00	
16-Apr-12	121	0.0	121	121	1.00	
17-Apr-12	88	0.0	88	88	1.00	
18-Apr-12	79	0.0	79	79	1.00	
19-Apr-12	94	0.0	94	94	1.00	
20-Apr-12	72	0.0	72	72	1.00	
21-Apr-12	80	0.0	80	80	1.00	
22-Apr-12	94	0.0	94	94	1.00	
23-Apr-12	141	0.0	141	<b>1</b> 41	1.00	
24-Apr-12	155	0.0	155	155	1.00	
25-Apr-12	113	0.0	113	113	1.00	
26-Apr-12	84	0.0	84	84	1.00	
27-Apr-12	113	0.0	113	113	1.00	
28-Apr-12	103	0.0	103	103	1.00	
29-Apr-12	107	0.0	107	107	1.00	
30-Apr-12	57	0.0	57	57	1.00	
1-May-12	shut in	shut in	shut in	shut in	shut in	
2-May-12	0	0.0	. 0	74	0.00	
3-May-12	69	0.0	69	69	1.00	
4-May-12	106	0.0	106	106	1.00	
5-May-12	111	0.0	111	111	1.00	
6-May-12	102	0.0	102	102	1.00	
7-May-12	137	0.0	137	137	1.00	
8-May-12	51	0.0	51	51	1.00	
9-May-12	72	0.0	72	72	1.00	
10-May-12	127	0.0	127	127	1.00	
11-May-12	161	0.0	161	161	1.00	
12-May-12	123	0.0	123	123	1.00	
13-May-12	92	0.0	92	92	1.00	
14-May-12	90	0.0	90	90	1.00	
15-May-12	88	0.0	88	88	1.00	

			=		
16-May-12	94	0.0	94	94	1.00
17-May-12	81	0.0	81	81	1.00
18-May-12	97	0.0	97	97	1.00
19-May-12	111	0.0	111	111	1.00
20-May-12	107	0.0	107	107	1.00
21-May-12	103	0.0	103	103	1.00
22-May-12	130	0.0	130	130	1.00
23-May-12	98	0.0	98	98	1.00
24-May-12	87	0.0	87	87	1.00
25-May-12	shut in				
26-May-12	shut in				
27-May-12	shut in				
28-May-12	71	0.0	71	71	1.00
29-May-12	61	0.0	61	61	1.00
30-May-12	112	0.0	112	112	1.00
31-May-12	145	0.0	145	145	1.00
1-Jun-12	126	0.0	126	126	1.00
2-Jun-12	131	0.0	131	131	1.00
3-Jun-12	96	0.0	96	96	1.00
4-Jun-12	97	0.0	97	97	1.00
5-Jun-12	104	0.0	104	104	1.00
6-Jun-12	110	0.0	110	110	1.00
7-Jun-12	80	0.0	80	80	1.00
8-Jun-12	107	0.0	107	107	1.00
9-Jun-12	108	0.0	108	108	1.00
10-Jun-12	107	0.0	107	107	1.00
11-Jun-12	116	0.0	116	116	1.00
12-Jun-12	79	0.0	79	79	1.00
13-Jun-12	73	0.0	73	73	1.00
14-Jun-12	104	0.0	104	104	1.00
15-Jun-12	70	0.0	70	70	1.00
16-Jun-12	81	0.0	81	81	1.00
17-Jun-12	106	0.0	106	106	1.00
18-Jun-12	96	0.0	96	96	1.00
19-Jun-12	79	0.0	79	79	1.00
20-Jun-12	108	0.0	108	108	1.00
21-Jun-12	142	0.0	142	142	1.00
22-Jun-12	103	0.0	103	103	1.00
23-Jun-12	128	0.0	128	128	1.00
24-Jun-12	115	0.0	115	115	1.00
25-Jun-12	116	0.0	116	116	1.00
26-Jun-12	66	0.0	66	66	1.00
27-Jun-12	93	0.0	93	93	1.00
28-Jun-12	95	0.0	95	95	1.00
29-Jun-12	77	0.0	77	77	1.00
30-Jun-12	109	0.0	109	109	1.00
Averages	100	0.0	100	101	0.99

			Total	Total		
	Injection	Dilution	Injection	Return	Ratio	
Date	Flow	Flow	Flow	Flow	Inj/Ret	
1-Apr-12	obut in	obust in	obustin	obut in	obut in	
2-Apr-12	shut in	shut in	shut in	shut in	shut in	
3-Apr-12	shut in	shut in	shut in	shut in	shut in	
•	shut in	shut in	shut in	shut in	shut in	
4-Apr-12 5-Apr-12	shut in	shut in	shut in	shut in	shut in	
•	shut in	shut in	shut in	shut in	shut in	
6-Apr-12	shut in	shut in	shut in	shut in	shut in	
7-Apr-12	shut in	shut in	shut in	shut in	shut in	
8-Apr-12	shut in	shut in	shut in	shut in	shut in	
9-Apr-12	shut in	shut in	shut in	shut in	shut in	
10-Apr-12	shut in	shut in	shut in	shut in	shut in	
11-Apr-12	shut in	shut in	shut in	shut in	shut in	
12-Apr-12	shut in	shut in	shut in	shut in	shut in	
13-Apr-12	shut in	shut in	shut in	shut in	shut in	
14-Apr-12	shut in	shut in	shut in	shut in	shut in	
15-Apr-12	shut in	shut in	shut in	shut in	shut in	
16-Apr-12	shut in	shut in	shut in	shut in	shut in	
17-Apr-12	shut in	shut in	shut in	shut in	shut in	
18-Apr-12	shut in	shut in	shut in	shut in	shut in	
19-Apr-12	shut in	shut in	shut in	shut in	shut in	
20-Apr-12	shut in	shut in	shut in	shut in	shut in	
21-Apr-12	shut in	shut in	shut in	shut in	shut in	
22-Apr-12	shut in	shut in	shut in	shut in	shut in	
23-Apr-12	shut in	shut in	shut in	shut in	shut in	
24-Apr-12	shut in	shut in	shut in	shut in	shut in	
25-Apr-12	shut in	shut in	shut in	shut in	shut in	
26-Apr-12	shut in	shut in	shut in	shut in	shut in	
27-Apr-12	shut in	shut in	shut in	shut in	shut in	
28-Apr-12	shut in	shut in	shut in	shut in	shut in	
29-Apr-12	shut in	shut in	shut in	shut in	shut in	
30-Apr-12	shut in	shut in	shut in	shut in	shut in	
1-May-12	shut in	shut in	shut in	shut in	shut in	
2-May-12	shut in	shut in	shut in	shut in	shut in	
3-May-12	shut in	shut in	shut in	shut in	shut in	
4-May-12	shut in	shut in	shut in	shut in	shut in	
5-May-12	shut in	shut in	shut in	shut in	shut in	
6-May-12	shut in	shut in	shut in	shut in	shut in	
7-May-12	shut in	shut in	shut in	shut in	shut in	
8-May-12	shut in				shut in	
-		shut in	shut in	shut in		
9-May-12	shut in	shut in	shut in	shut in	shut in	
10-May-12	shut in	shut in	shut in	shut in	shut in	
11-May-12	shut in	shut in	shut in	shut in	shut in	
12-May-12	shut in	shut in	shut in	shut in	shut in	
13-May-12	shut in	shut in	shut in	shut in	shut in	
14-May-12	shut in	shut in	shut in	shut in	shut in	
15-May-12	shut in	shut in	shut in	shut in	shut in	

16-May-12	shut in				
17-May-12	shut in				
18-May-12	shut in				
19-May-12	shut in				
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29-May-12	shut in				
30-May-12	shut in				
31-May-12	shut in				
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27-Jun-12	shut in				
28-Jun-12	shut in				
29-Jun-12	shut in				
30-Jun-12	shut in				
Averages	shut in				



JUL 2 0 2012

## Cluster 1 2012 Monitor Well Results 2<sup>nd</sup> Quarter



<u> </u>		
Date	Well Number	Chloride Concentration (mg/L)
June 2012	Cluster 1 M.W. 1	496.3
June 2012	Cluster 1 M.W. 2	819.0
June 2012	Cluster 1 M.W. 3	49.6
June 2012	Cluster 1 M.W. 4	1,489.0
June 2012	Cluster 1 M.W. 5	427.2
June 2012	Cluster 1 M.W. 6	159.5
June 2012	Cluster 1 M.W. 7	453.8
June 2012	Cluster 1 M.W. 8	398.8
June 2012	Cluster 1 M.W. 9	8012.4
June 2012	Cluster 1 M.W. 10	3048.9
June 2012	Cluster 1 M.W. 11	563.7
June 2012	Cluster 1 M.W. 12	584.9
June 2012	Cluster 1 M.W. 13	3722.5
June 2012	Cluster 1 M.W. 14	253.5
June 2012	Cluster 1 M.W. 34	2198.1
June 2012	Cluster 1 M.W. 35	115.2
June 2012	Cluster 1 M.W. 36	8.9
June 2012	Cluster 1 M.W. 37	2286.7
June 2012	Cluster 1 M.W. 38	3.5
June 2012	Cluster 1 M.W. 39	17.7
June 2012	Cluster 1 M.W. 40	234.0

## Cluster 2 2012 Monitor Well Results 2nd Quarter

Date	Well Number	Chloride Concentration (mg/L)
June 2012	Cluster 2 M.W. 1	124.1
June 2012	Cluster 2 M.W. 2	Dry well
June 2012	Cluster 2 M.W. 4	77.9
June 2012	Cluster 2 M.W. 5	434.3
June 2012	Cluster 2 M.W. 6	28.4
June 2012	Cluster 2 M.W. 33	42.5

#### MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

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DATE SAMPLED	TIME SAMPLED	SAMPLE#	SAMPLE	R NAME/SIGNATURE	
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and for mount or market and a supple substitute	anadamida and anada and and and and and and and	3 (PP-3)	annen Seriebuditeten er et dan det in et de	and the second	and .
And word and a second		4 (111-126-1)			est or
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6-13-17	72:00 F.M	6 (CL2-1)	735 1		gen1
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# MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

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July 02, 2012

Mosaic Potash - Hersey Attn: Ms. Allison VanOs 1395 - 135th Avenue Hersey, MI 49639



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### **Project: Quarterly Monitoring of Inorganic Pollutants**

Dear Ms. Allison VanOs,

Enclosed is a copy of the laboratory report for the following work order(s) received by TriMatrix Laboratories:

Work Order

Received

Description

1206207

06/13/2012

Laboratory Services

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and/or one of the following certification programs:

ACLASS DoD-ELAP/ISO17025 (#ADE-1542); Arkansas DEP (#10-046-0); Florida DEP (#E87622-24); Georgia EPD (#E87622-24); Illinois DEP (#002841); Kansas DPH (#E-10302); Kentucky DEP (#0021); Louisiana DEP (#03068); Michigan DPH (#0034); Minnesota DPH (#367345); New York ELAP (#44950); North Carolina DNRE (#659); Texas CEQ (#T104704495-11-1); Virginia DCLS (#1239); Wisconsin DNR (#999472650); USDA Soil Import Permit (#P330-09-00163).

Any qualification or narration of results, including sample acceptance requirements and test exceptions to the above referenced programs, is presented in the Statement of Data Qualifications section of this report. Estimates of analytical uncertainties and certification documents for the test results contained within this report are available upon request.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Jennifer L. Rice Project Chemist



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: **Disposal** 

Lab Sample ID:

1206207-01

Matrix:

Water

Work Order:

1206207

Description:

Laboratory Services

Sampled:

06/12/12 08:00

Sampled By:

i By: A.V.

Received:

06/13/12 09:45

## Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Barium	86	10	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
Calcium	330	50	mg/L	100	USEPA-6010C	06/19/12 08:46	KLV	1207536
Cobalt	<10	10	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
Copper	18	10	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
Iron	370	50	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
Lead	<50	50	ug/L	1.	USEPA-6010C	06/19/12 12:57	KLV	1207536
Magnesium	66	0.50	mg/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
Manganese	110	10	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536
*Selenium	7.1	5.0	ug/L	5	USEPA-6020A	06/20/12 11:28	KLV	1207538
Sodium	7000	50	mg/L	100	USEPA-6010C	06/19/12 08:46	KLV	1207536
Zinc	< 20	20	ug/L	1	USEPA-6010C	06/19/12 12:57	KLV	1207536



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\*See Statement of Data Qualifications

Page 2 of 11



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Disposal

Lab Sample ID:

1206207-01

Matrix:

Water

Work Order:

1206207

Description:

Laboratory Services

Sampled:

06/12/12 08:00

Sampled By: Received:

A.V.

06/13/12 09:45

## Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	97	20	mg/L	1	SM 2320 B 20th	06/22/12 08:45	SKA	1207799
Alkalinity, Carbonate	<2.0	2.0	mg/L	1	SM 2320 B 20th	06/22/12 08:45	SKA	1207800
Alkalinity, Total	97	20	mg/L	1	SM 2320 B 20th	06/22/12 08:45	SKA	1207801
*Bromide	<300	300	. mg/L	100	ASTM D 1246-95 (99)	06/20/12 14:46	KCS	1207715
Chloride	14000	500	mg/L	500	SM 4500-CI E 20th	06/22/12 13:01	LMA	1207853
Conductivity @ 25° C	41790	5	umhos/cm	1	SM 2510 B 20th	06/19/12 15:04	KCS	1207654
<b>≠</b> pH	<b>/7.5</b>	1.0	pH Units	1	SM 4500-H B 20th	06/14/12 15:51	SKA	1207440
*Oxidation/Reduction Potential	241	1	mV	1	ASTM D 1498-76	06/14/12 07:30	LMA	1207420
Sulfate	260	50	mg/L	10	ASTM D516-90 (02)	06/21/12 12:37	LMA	1207792
Residue, Dissolved @ 180° C	29300	2500	mg/L	1	SM 2540 C 20th	06/14/12 13:42	KC5	1207467
Specific Gravity	<b>J</b> 1.0220	0.7000	@ 60 °F	1	ASTM D 1429-79	06/22/12 16:00	HLB	1207836
*Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	06/15/12 14:33	KAR	1207569
*Sulfide, Total	2.2	1.0	mg/L	1	SM 4500-S2 F 20th	06/15/12 14:20	KAR	1207595



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\*See Statement of Data Qualifications

Page 3 of 11



Client: Project: Mosaic Potash - Hersey

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle

Lab Sample ID:

1206207-02

Matrix:

**12062** Water

Work Order:

1206207

Description:

Laboratory Services

Sampled:

06/12/12 08:15

Sampled By:

y: A.V.

Received:

06/13/12 09:45

## Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
*Barium	200	50	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Calcium	1300	2.5	mg/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Cobalt	< 50	50	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Copper	<50	50	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Iron	1300	250	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Lead	<250	250	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Magnesium	94	2.5	mg/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Manganese	140	50	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536
*Selenium	<100	100	ug/L	100	USEPA-6020A	06/20/12 11:16	KLV	1207538
Sodium	110000	500	mg/L	1000	USEPA-6010C	06/19/12 08:50	KLV	1207536
*Zinc	<100	100	ug/L	5	USEPA-6010C	06/19/12 13:02	KLV	1207536





Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle Lab Sample ID:

1206207-02

Matrix:

Water

Work Order:

1206207

Description:

Laboratory Services

Sampled:

06/12/12 08:15

Sampled By:

A.V.

Received:

06/13/12 09:45

## Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	41	20	mg/L	1	SM 2320 8 20th	06/22/12 08:45	SKA	1207799
Alkalinity, Carbonate	<2.0	2.0	mg/L	1	SM 2320 B 20th	06/22/12 08:45	SKA	1207800
*Bromide	960	600	mg/L	200	ASTM D 1246-95 (99)	06/20/12 14:46	KCS	1207715
Conductivity @ 25° C	224000	5	umhos/cm	1	SM 2510 B 20th	06/19/12 15:04	KCS	1207654
Specific Gravity	1.2118	0.7000	@ 60 °F	1	ASTM D 1429-79	06/22/12 16:00	HLB	1207836
*Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	06/15/12 14:43	KAR	1207569
Alkalinity, Total	41	20	mg/L	1	SM 2320 B 20th	06/22/12 08:45	SKA	1207801
*Oxidation/Reduction Potential	139	1	mV	1	ASTM D 1498-76	06/14/12 07:30	LMA	1207420
*pH	6.5	1.0	pH Units	1	SM 4500-H B 20th	06/14/12 15:51	SKA	1207440
Residue, Dissolved @ 180° C	310000	5000	mg/L	1	SM 2540 C 20th	06/14/12 13:42	KCS	1207467
Chloride	170000	2500	mg/L	2500	SM 4500-CI E 20th	06/22/12 13:01	LMA	1207853
Sulfate	2200	500	mg/L	100	A5TM D516-90 (02)	06/21/12 14:15	LMA	1207792
Sulfide, Total	2.8	1.0	mg/L	1	SM 4500-S2 F 20th	06/15/12 14:20	KAR	1.207595



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\*See Statement of Data Qualifications

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## STATEMENT OF DATA QUALIFICATIONS

### Total Metals by EPA 6000/7000 Series Methods

Barium

Qualification: The RL for this analysis has been elevated due to sample matrix interference.

Analysis: USEPA-6010C

Sample/Analyte: 1206207-02 Recycle

 1206207-02
 Recycle
 Calcium

 1206207-02
 Recycle
 Cobalt

 1206207-02
 Recycle
 Copper

 1206207-02
 Recycle
 Iron

 1206207-02
 Recycle
 Lead

1206207-02RecycleMagnesium1206207-02RecycleManganese

1206207-02 Recycle Zinc

Analysis: USEPA-6020A

Sample/Analyte: 1206207-02 Recycle Selenium

Qualification: Due to sample matrix-related Internal Standard failure, the sample was reanalyzed at dilution. The

RL for this analyte has been elevated.

Analysis: USEPA-6020A

Sample/Analyte: 1206207-01 Disposal Selenium

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## STATEMENT OF DATA QUALIFICATIONS

## Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Qualification: The quality control batch(s), associated with the following samples and analyses, do not contain an

MS/MSD or MS/DUP because client specific matrix QC was not requested. An LCS and LCSD were

analyzed as the measure of batch precision and accuracy.

Analysis: ASTM D 1246-95 (99)

Sample/Analyte: 1206207-01

Disposal

Bromide

Recycle 1206207-02

Bromide

Analysis: SM 5310 C 20th

Sample/Analyte: 1206207-01

Disposal

Carbon, Total Organic

1206207-02

Recycle

Carbon, Total Organic

Qualification: The laboratory duplicate RPD for this sample exceeded the control limit. Since the initial and/or the

duplicate sample result was less than 5 times the reporting limit, the initial reported sample result is

not qualified.

Analysis: SM 4500-S2 F 20th

Sample/Analyte: 1206207-01

Disposal

Sulfide, Total

Qualification: The referenced method requires analysis occur immediately after sample collection. Because

analysis was not performed in the field, the reported result must be considered estimated.

Analysis: ASTM D 1498-76

Sample/Analyte: 1206207-01

1206207-02

Disposal Recycle

Oxidation/Reduction Potential

Oxidation/Reduction Potential

Analysis: SM 4500-H B 20th

Sample/Analyte: 1206207-01

Disposal

рH

1206207-02

Recycle

рH

**Qualification:** The following reported test methods and analyte(s) are exceptions to our NELAP Fields of Accreditation,

or for which accreditation is not required, applicable, or available.

Analysis: ASTM D 1429-79

Analyte(s): Specific Gravity

Analysis: ASTM D 1498-76

Analyte(s): Oxidation/Reduction Potential

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		COC No. 141046

Page 8 of 11



SAMPLE RECEIVING / LOG-IN CHECKLIST moseir Brush RIMATRIX TR (390 19202) Recorded by Invitate Care Swa Assironal Coeler Therrementer Used [] Olgital Thermorphies (#54) C Sox alfombaliste Fourt 6/13/12 C) OPEN C3 Career es ustody Sease Custody Seass Cuspete Seate gl Hose C) Mose Ci Nose i''T None-C Prosent lineae C Prosent French C President / Helect ○ Present / Induce Present / Not intect ☐ Prosseral foot Intoca 77 Present (Not much Fresent / Het Indael adata Lacatron quiant Location Dispersed Ton Middle / Bottom Disperses / Top / Middle / Bottom Disparsed / Top / Migdle / Botton Disperant For Moldle Softon Cantant Teproprature Taken Vie aniani/Temperature Taken Visc DeptendTemperation Fatien Via: Costant/Termestature Taken Via Losse toc. Ava 2.0 containers Course los : Ava 2-3 comment C Loove (on / Ave 2-5 containers CO Labore to CAVE 2-2 versions CI Suggest two Ave In consumers [] Guarras ton : Aug. 5 - Economoro O Sagged (se ! Avg 2-4 completes CI Bagged toe / Avg 2-3 containent D Stocker was 2 R continuents CF 500 kg / Avg 2-5 contamen □ Bue to - Ave 2-7 consistent D. Burn seed work has purchaseers Al None - Avp 7 - Emphasismus CI Name / Avg 2-3 completes ☐ Nens / Avg 2-8 cohlemens ☐ More / Avg 2-3 com/stoore r mate Terroporetore Yakan Vax Jesnato Tomporaturo Token Via demais Temperature Takes Via: xecuta Temperatura Taban VIs: (78) Yestmenature Abank (78) C Temporature Stank (TG) (Tamperature Blank (TS) ○ Tomperature Blank ("(B)) C 3 Container 1 Container C 1 Contains □ 1 Contamer Correction Correction Correction Correction Recorded 10 Resources ACC Acquair 10 Thebrosen Received "C Actual 10 Actual 10 Fester 'C Tomog diapris Ferrer, Steady Terup Blank: Yeary Bravik Aproximation (Linguistic Control of Control Skutation - Pagengagesetere income thought 28.1 2B. 4 Average "C Control to on COVID Cooler ID on CCC? Cooker #2 on COC? O Corsy Condoc? O YOU THE Blank received? CJ YOC Tap Blank received? ☐ VOC Trip Slank received? O VOC Try Sent received? If any shaded creas checked, complete Sample Receiving Mon-Conformance and/or inventory Form Paperwork Recaived Check Sample Preservation Chair of Custody recording? If No. (replaced By ø Average secrole temperature 35° C? O Was thannal preservation required 'n DIE K Received for Lab Signed/Sata/Time? Ø C) Streeting document? If "Ng", Project Cherelat Approval Inhela.  $\cap$ 2°one if "Yes" Completed Non-Con-Cooky - Continuentory Form? COC Information C Completed Sample Preservation Verification Form? A thromas action (C) (m) A Samples chemically preserved correctly? COC ID Numbers. If "hip", added prange tag? Feceives unerpreserved VOC solie? CLUSON O NO. SO. Check COC for Accuracy Check for Short Hold-Time Prep/Analyses C Boctoregagesal d ☐ Analysis Requested? O Air Boos AFTER HOURS CINEY: Sample ID matches COC?

Sample Date and Time matches COC? COPIES OF COC TO LAS AREALS: O proces / Method Pro-Preservad کُا C FormsteinyderAktenyde C) WONE RECEIVED Á Conteins type consisted on COQ? Æ Green-taggad containecs A RECEIVED, COCA TO LABOR Al container types indicated are received? ☐ Yakow/White-legged 12, stoppes (SV Pr Sample Condition Summary A Broken ountginesshide? 32 History or strongsplate labels? "M. Pegesia eforcasion en lebyta"; "IQ" Low volume monved? Trip Break per helies on COC 🖄 inappropriate or non-Triffelink contributions received? Pagenyork Delivered (Catry Time) C) VOC visis / TOX containers have headspace? Yes WNo C) Extre semble Roceness I controlipere nee Releas on COC Log to Forms - Heckeying Lag-In\_Checking deviators 3.4



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Continuer Type Tog Circle Proservative Expensed phi COC Line #2 COC Line #2 COC Line #4 COC Line #5 VOC Line #8	11. Blug NeO+ 232	Blie 19,300 2	OSSE 10 Frank 1550		Qrees None	Rail HRVO <sub>2</sub>	Sel Stock		Sample contains mormation root Recurd adjuster form. Do not ac container types  Container Size (mL)  Container Type 5  See  1000  Container Type 4  125  See  500	ar and recent asset.  I gift on this light of for 3, 8, and 15.  Original Vol. Preservative (ML)  NaOH  25  5.0  H.SQ.  9.5  1.0  2.0
Tag Crice Tag Crice Proservative Essented per COC Line #1 COC Line #2 COC Line #4 CTC Line #4 CTC Line #5 COC Line #6 CTC Line #6 CTC Line #6 CTC Line #7 CTC Line #7	11. Blug NeO+ 232	Blie 19,300 2	OSSE 10 Frank 1550		Qrees None	Rail HRVO <sub>2</sub>	Sel Stock		Sample contains information root Record adjuster form. Do not so container types  Container Type 5  See 1000  Comisiner Type 4 125 500 1000	ar and receive assisted. I giff on this lips off for 3, 8, and 15.  Original Vol. 1 Preservative (mL) HisCul 23 5.0 HisCul 2.0 4.0
Contamer Type Tigg Circle Preservative Expected phi COC Line #1 COC Line #2 COC Line #2 COC Line #4	11. Blug NeO+ 232	Blie 19,300 2	OSSE 10 Frank 1550		Qrees None	Rail HRVO <sub>2</sub>	Sel Stock		Sample contains mormation root Recurd adjuster form. Do not ac container types  Container Size (mL)  Container Type 5  See  1000  Container Type 4  125  See  500	ar and recent asset.  I gift on this light of for 3, 8, and 15.  Original Vol. Preservative (ML)  NaOH  25  5.0  H.SQ.  9.5  1.0  2.0
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Page 10 of 11



COST POTOS VIEW SERVER REVERSE SON CONTRACTOR

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# SAMPLE RECEVING NON-CONFORMANCE REPORT

List non-conformance assess associated with this work order in the chart below/left. Identify discrepancies between the CCC and sample tags in the chart

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August 21, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: Lisa Perenchio

RE: Class III Solution Mining Wells Permit No. MI-133-3G-A002

Monthly Report for July 2012



AUG 27 2012



During the month of July, Mosaic Potash solution well operations were as follows:

- Cavity KCl 1010 was not in operation for this month.
- Cavity KCl 1020 was in operation for 16 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCl 1050 was in operation for 31 days this month.
- Cavity KCl 1060 was in operation for 24 days this month.
- Cavity KCl 2030 was in operation for 29 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCl 2061 was in operation for 24 days this month.
- Cavity KCl 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

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Attachments



AUG 27 2012

## CAVITY 1010

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AUG 27 2012

## Cavity 1010

## Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Jul-12	shut in	shut in	shut in	
2-Jul-12	shut in	shut in	shut in	
3-Jul-12	shut in	shut in	shut in	
4-Jul-12	shut in	shut in	shut in	
5-Jul-12	shut in	shut in	shut in	
6-Jul-12	shut in	shut in	shut ir	
7-Jul-12	shut in	shut in	shut ir	
8-Jul-12	shut in	shut in	shut in	
9-Jul-12	shut in	shut in	shut in	
10-Jul-12	shut in	shut in	shut in	
11-Jul-12	shut in	shut in	shut in	
12-Jul-12	shut in	shut in	shut in	
13-Jul-12	shut in	shut in	shut in	
14-Jul-12	shut in	shut in	shut ii	
15-Jul-12	shut in	shut in	shut in	
16-Jul-12	shut in	shut in	shut i	
17-Jul-12	shut in	shut in	shut i	
18-Jul-12	shut in	shut in	shut i	
19-Jul-12	shut in	shut in	shut i	
20-Jul-12	shut in	shut in	shut i	
21-Jul-12	shut in	shut in	shut i	
22-Jul-12	shut in	shut in	shut i	
23-Jul-12	shut in	shut in	shut i	
24-Jul-12	shut in	shut in	shut i	
25-Jul-12	shut in	shut in	shut i	
26-Jul-12	shut in	shut in	shut i	
27-Jul-12	shut in	shut in	shut i	
28-Jul-12	shut in	shut in	shut i	
29-Jul-12	shut in	shut in	shut i	
30-Jul-12	shut in	shut in	shut i	
31-Jul-12	shut in	shut in	shut i	



AUG 2 7 2012

## CAVITY 1020 V

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## Cavity 1020

## Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jul-12	1144	194	207
2-Jul-12	1103	214	246
3-Jul-12	1127	324	373
4-Jul-12	1145	<b>√</b> 340	359
5-Jul-12	1169	332	358
6-Jul-12	1120	331	370
7-Jul-12	1144	336	368
8-Jul-12	1152	338	377
9-Jul-12	1123	269	279
10-Jul-12	1150	217	229
11-Jul-12	1152	211	236
12-Jul-12	1137	86	203
13-Jul-12	1138	195	132
14-Jul-12	1116	219	213
15-Jul-12	1143	200	217
16-Jul-12	V 1180	66	73
17-Jul-12	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut in
21-Jul-12	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in
27-Jul-12	shut in	shut in	shut in
28-Jul-12	shut in	shut in	shut in
29-Jul-12	shut in	shut in	shut in
30-Jul-12	shut in	shut in	shut in
31-Jul-12	shut in	shut in	shut in



AUG 27 2012

## Cavity 1020

Jul-12 Monthly Averages

Injection Pressure (psi)

1140

Injection Flow (gpm)

242

Return Flow (gpm)

265

Maximum Injection Pressure and corresponding Injection Flow

Date 16-Jul-12 Injection Pressure (psi)

Injection Flow (gpm)

1180

66

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Jul-12

1103

214

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

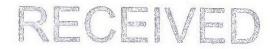
Injection Flow (gpm)

Injection Pressure (psi)

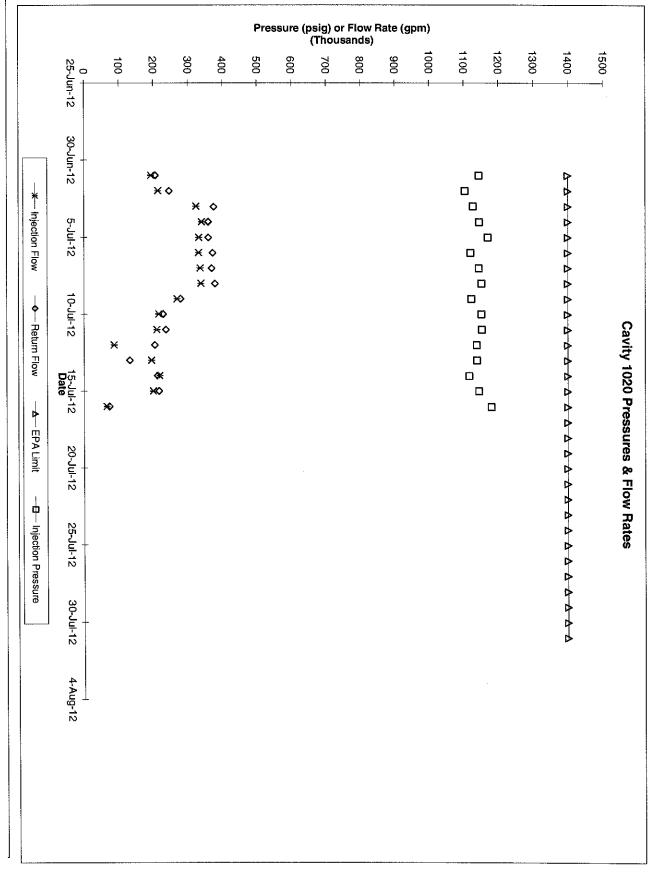
4-Jul-12

340

1145



AUG 27 2012



## CAVITY 1040

# RECEVED

AUG 27 2012

## Cavity 1040

## Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Jul-12	shut in	shut in	shut in	
2-Jul-12	shut in	shut in	shut in	
3-Jul-12	shut in	shut in	shut in	
4-Jul-12	shut in	shut in	shut in	
5-Jul-12	shut in	shut in	shut in	
6-Jul-12	shut in	shut in	shut in	
7-Jul-12	shut in	shut in	shut in	
8-Jul-12	shut in	shut in	shut in	
9-Jul-12	shut in	shut in	shut in	
10-Jul-12	shut in	shut in	shut in	
11-Jul-12	shut in	shut in	shut it	
12-Jul-12	shut in	shut in	shut in	
13-Jul-12	shut in	shut in	shut in	
14-Jul-12	shut in	shut in	shut i	
15-Jul-12	shut in	shut in	shut i	
16-Jul-12	shut in	shut in	shut i	
17-Jul-12	shut in	shut in	shut i	
18-Jul-12	shut in	shut in	shuti	
19-Jul-12	shut in	shut in	shut i	
20-Jul-12	shut in	shut in	shut i	
21-Jul-12	shut in	shut in	shut i	
22-Jul-12	shut in	shut in	shut i	
23-Jul-12	shut in	shut in	shut i	
24-Jul-12	shut in	shut in	shut i	
25-Jul-12	shut in	shut in	shut i	
26-Jul-12	shut in	shut in	shut i	
27-Jul-12	shut in	shut in	shut i	
28-Jul-12	shut in	shut in	shut i	
29-Jul-12	shut in	shut in	shut i	
30-Jul-12	shut in	shut in	shut i	
31-Jul-12	shut in	shut in	shut i	



AUG 2 7 2012

## CAVITY 1050

# RECEVED

AUG 27 2012

Cavity 1050

## Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Returr Flow (gpm)
1-Jul-12	1185	125	125
2-Jul-12	1150	176	176
3-Jul-12	1198	161	161
4-Jul-12	1200	146	146
5-Jul-12	1200	149	149
6-Jul-12	1175	150	150
7-Jul-12	1181	149	149
8-Jul-12	1206	154	154
9-Jul-12	1175	140	140
10-Jul-12	1188	133	133
11-Jul-12	1189	130	130
12-Jul-12	1180	114	114
13-Jul-12	1200	84	84
14-Jul-12	1188	161	161
15-Jul-12	1200	157	157
16-Jul-12	1207	152	152
17-Jul-12	1207	170	170
18-Jul-12	1160	189	189
19-Jul-12	1175	177	177
20-Jul-12	1178	165	165
21-Jul-12	1200	166	166
22-Jul-12	1200	151	151
23-Jul-12	1180	154	154
24-Jul-12	1183	151	151
25-Jul-12	1183	157	157
26-Jul-12	1188	<b>√1</b> 99	199
27-Jul-12	1193	174	174
28-Jul-12	1195	175	175
29-Jul-12	1175	175	175
30-Jul-12	1195	162	162
31-Jul-12	1190	160	160

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## Cavity 1050

Jul-12 // Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1188

155

155

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

16-Jul-12

1207 🗸

152

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Jul-12

1150

176

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

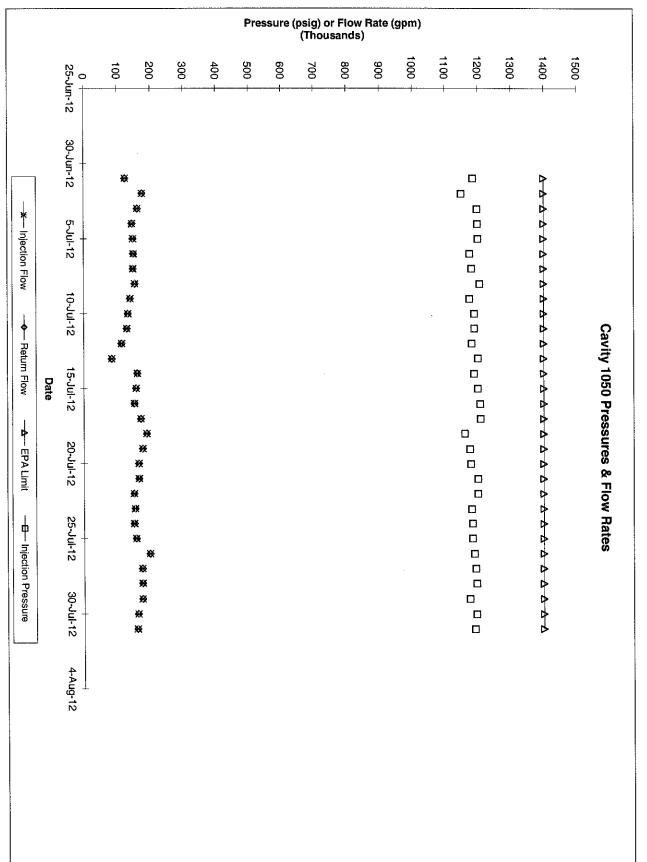
26-Jul-12

199

1188



AUG 2 7 2012



## CAVITY 1060

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AUG 27 2012

### Cavity 1060 V

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Jul-12	1144	215	211
2-Jul-12	1095	160	164
3-Jul-12	shut in	shut in	shut in
4-Jul-12	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shut in
7-Jul-12	shut in	shut in	shut in
8-Jul-12	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in
10-Jul-12	1149	139	147
11-Jul-12	1150	153	136
12-Jul-12	1137	229	212
13-Jul-12	1138	132	161
14-Jul-12	1113	153	146
15-Jul-12	1143	201	207
16-Jul-12	1147	229	242
17-Jul-12	1135	271	302
18-Jul-12	1094	285	287
19-Jul-12	1108	271	298
20-Jul-12	1128	278	290
21-Jul-12	1137	278	323
22-Jul-12	1107	285	306
23-Jul-12	1064	340	344
24-Jul-12	1069	333	335
25-Jul-12	1121	333	346
26-Jul-12	1120	319	302
27-Jul-12	1127	319	333
28-Jul-12	V 1155	340	339
29-Jul-12	1151	313	332
30-Jul-12	1152	340	339
31-Jul-12	1139	340	348



AUG 2 7 2012

Jul-12 1

Monthly Averages

Injection Pressure

1126

Injection Flow

261

Return Flow

269

Maximum Injection Pressure and corresponding Injection Flow

Date 28-Jul-12 Injection Pressure

1155

Injection Flow

340

Minimum Injection Pressure and corresponding Injection Flow

Date 23-Jul-12

Injection Pressure

1064

Injection Flow

340

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

23-Jul-12

Injection Flow

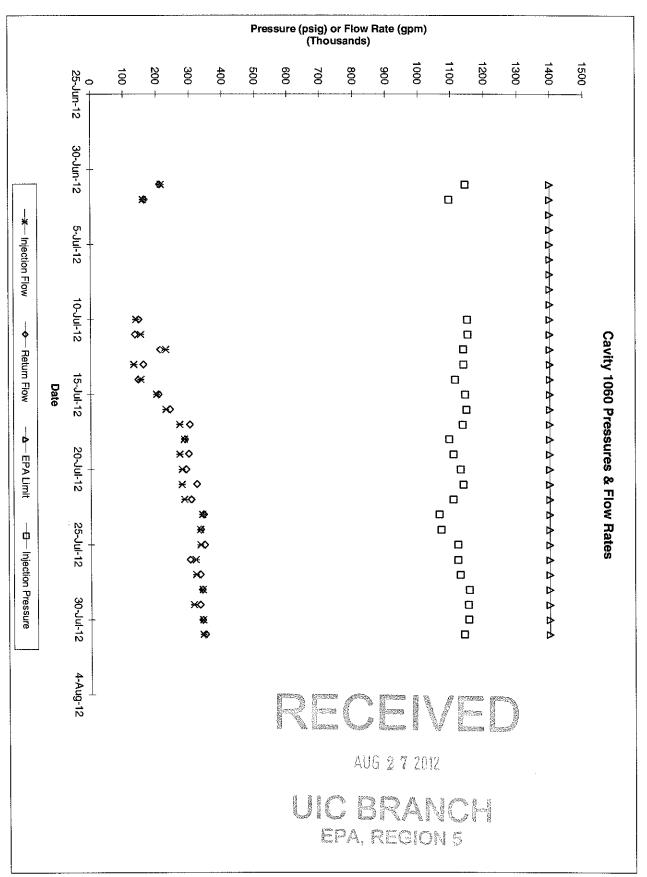
340

Injection Pressure

1064



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Cavity 2030

Daily Averages

		Com (Com (Com (Com (Com (Com (Com (Com (	
	Injection	Injection	Return
Date	Pressure	Flow	Flow (gpm)
	(psi)	(gpm)	
1-Jul-12	1185	259	259
2-Jul-12	1150	192	192
3-Jul-12	1198	223	223
4-Jul-12	1200	208	208
5-Jul-12	1200	222	222
6-Jul-12	1175	215	215
7-Jul-12	1181	229	229
8-Jul-12	1206	222	222
9-Jul-12	1175	210	210
10-Jul-12	1188	219	219
11-Jul-12	1189	211	211
12-Jul-12	1180	238	238
13-Jul-12	1200	136	136
14-Jul-12	1188	211	211
15-Jul-12	1200	214	214
16-Jul-12	1207	200	200
17-Jul-12	1207	226	226
18-Jul-12	1160	256	256
19-Jul-12	1175	206	206
20-Jul-12	1170	133	133
21-Jul-12	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in
23-Jul-12	1180	265	265
24-Jul-12	1183	240	240
25-Jul-12	1183	259	259
26-Jul-12	1188	<b>269</b>	269
27-Jul-12	1193	255	255
28-Jul-12	1195	216	216
29-Jul-12	1175	251	251
30-Jul-12	1195	215	215
31-Jul-12	1190	252	252

Jul-12 Monthly Averages

Injection Pressure (psi)

1187

Injection Flow (gpm)

222

Return Flow (gpm)

222

Maximum Injection Pressure and corresponding Injection Flow

Date 16-Jul-12 Injection Pressure (psi)

1207

Injection Flow (gpm)

200

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Jul-12

1150

192

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

26-Jul-12

Injection Flow (gpm)

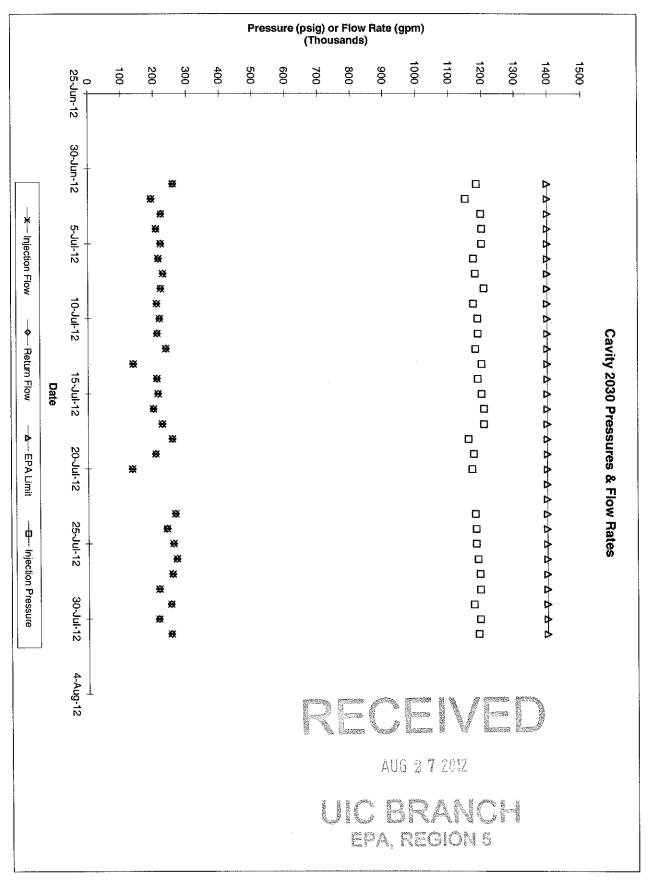
Injection Pressure (psi)

1188

269

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### CAVITY 2040 🗸

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### Daily Averages

Data	Injection Pressure	Injection Flow	Return Flow
Date	(psi)	(gpm)	(gpm)
1-Jul-12	shut in	shut in	shut in
2-Jul-12	shut in	shut in	shut in
3-Jul-12	shut in	shut in	shut in
4-Jul-12	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shut in
7-Jul-12	shut in	shut in	shut in
8-Jul-12	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in
10-Jul-12	shut in	shut in	shut in
11-Jul-12	shut in	shut in	shut in
12-Jul-12	shut in	shut in	shut in
13-Jul-12	shut in	shut in	shut in
14-Jul-12	shut in	shut in	shut in
15-Jul-12	shut in	shut in	shut in
16-Jul-12	shut in	shut in	shut in
17-Jul-12	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut in
21-Jul-12	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in
27-Jul-12	shut in	shut in	shut in
28-Jul-12	shut in	shut in	shut in
29-Jul-12	shut in	shut in	shut in
30-Jul-12	shut in	shut in	shut in
31-Jul-12	shut in	shut in	shut in



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## CAVITY 2061 V

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### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Jul-12	1185	108	108
2-Jul-12	1125	65	65
3-Jul-12	1220	100	100
4-Jul-12	1200	95	95
5-Jul-12	1200	97	97
6-Jul-12	1183	98	98
7-Jul-12	1181	79	79
8-Jul-12	1206	84	84
9-Jul-12	1175	86	86
10-Jul-12	1188	85	85
11-Jul-12	1189	99	99
12-Jul-12	1150	67	67
13-Jul-12	1200	56	56
14-Jul-12	1183	67	67
15-Jul-12	1200	56	56
16-Jul-12	shut in	shut in	shut in
17-Jul-12	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in
20-Jul-12	1200	49	49
21-Jul-12	1200	192 🕶	192
22-Jul-12	1200	172	172
23-Jul-12	shut in	shut in	shut in
24-Jul-12	1193	92	92
25-Jul-12	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut in
27-Jul-12	1200	60	60
28-Jul-12	1195	96	96
29-Jul-12	1180	59	59
30-Jul-12	1200	106	106
31-Jul-12	1190	100	100



AUG % 7 2012

Jul-12

Monthly Averages

Injection Pressure (psi)

1189

Injection Flow (gpm)

90

Return Flow (gpm)

90

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

3-Jul-12

1220

100

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Jul-12

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

21-Jul-12

Injection Flow (psi)

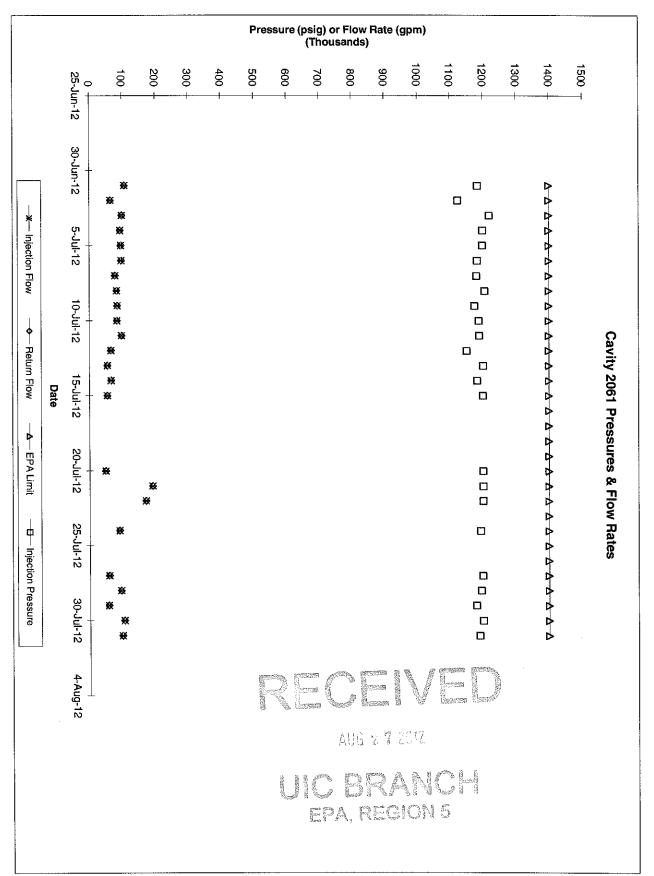
Injection Pressure (psi)

192

1200



AUG % 7 2012



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### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
Date	(psi)	(gpm)	(gpm)
1-Jul-12	shut in	shut in	shut in
2-Jul-12	shut in	shut in	shut in
3-Jul-12	shut in	shut in	shut in
4-Jul-12	shut in	shut in	shut in
5-Jul-12	shut in	shut in	shut in
6-Jul-12	shut in	shut in	shut in
7-Jul-12	shut in	shut in	shut in
8-Jul-12	shut in	shut in	shut in
9-Jul-12	shut in	shut in	shut in
10-Jul-12	shut in	shut in	shut in
11-Jul-12	shut in	shut in	shut in
12-Jul-12	shut in	shut in	shut in
13-Jul-12	shut in	shut in	shut in
14-Jul-12	shut in	shut in	shut in
15-Jul-12	shut in	shut in	shut ir
16-Jul-12	shut in	shut in	shut ir
17-Jul-12	shut in	shut in	shut in
18-Jul-12	shut in	shut in	shut in
19-Jul-12	shut in	shut in	shut in
20-Jul-12	shut in	shut in	shut ir
21-Jul-12	shut in	shut in	shut in
22-Jul-12	shut in	shut in	shut in
23-Jul-12	shut in	shut in	shut in
24-Jul-12	shut in	shut in	shut in
25-Jul-12	shut in	shut in	shut in
26-Jul-12	shut in	shut in	shut i
27-Jul-12	shut in	shut in	shut it
28-Jul-12	shut in	shut in	shut it
29-Jul-12	shut in	shut in	shut i
30-Jul-12	shut in	shut in	shut it
31-Jul-12	shut in	shut in	shut in



AUS 27 782



June 11, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU - 16J Chicago, IL 60604

JUN 1 3 2012

Attn: Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for May 2012



During the month of May, Mosaic Potash solution well operations were as follows:

- Cavity KCl 1010 was not in operation for this month.
- Cavity KCl 1020 was in operation for 25 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 31 days this month.
- Cavity KCI 1060 was in operation for 7 days this month.
- Cavity KCI 2030 was in operation for 31 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 27 days this month.
- Cavity KCl 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- 2. Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments

Cavity 1010

### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-May-12	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in
7-May-12	shut in	shut in	shut in
8-May-12	shut in	shut in	shut in
9-May-12	shut in	shut in	shut in
10-May-12	shut in	shut in	shut in
11-May-12	shut in	shut in	shut in
12-May-12	shut in	shut in	shut in
13-May-12	shut in	shut in	shut in
14-May-12	shut in	shut in	shut in
15-May-12	shut in	shut in	shut in
16-May-12	shut in	shut in	shut in
17-May-12	shut in	shut in	shut in
18-May-12	shut in	shut in	shut in
19-May-12	shut in	shut in	shut in
20-May-12	shut in	shut in	shut in
21-May-12	shut in	shut in	shut in
22-May-12	shut in	shut in	shut in
23-May-12	shut in	shut in	shut in
24-May-12	shut in	shut in	shut in
25-May-12	shut in	shut in	shut in
26-May-12	shut in	shut in	shut in
27-May-12	shut in	shut in	shut in
28-May-12	shut in	shut in	shut in
29-May-12	shut in	shut in	shut in
30-May-12	shut in	shut in	shut in
31-May-12	shut in	shut in	shut in

Cavity 1020

### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-May-12	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in
7-May-12	1035	220	220
8-May-12	1108	241	258
9-May-12	1109	230	257
10-May-12	1117	228	255
11-May-12	1134	220	236
12-May-12	1139	226	255
13-May-12	1108	245	274
14-May-12	1109	249	275
15-May-12	1083	240	266
16-May-12	1091	√ 376	121
17-May-12	1135	119	407
18-May-12	1124	201	223
19-May-12	1127	248	269
20-May-12	1130	245	269
21-May-12	1130	234	255
22-May-12	1155	238	249
23-May-12	1147	228	266
24-May-12	1134	247	272
25-May-12	1162	279	320
26-May-12	1147	278	308
27-May-12	1128	296	299
28-May-12	1147	268	289
29-May-12	1146	266	292
30-May-12	1148	269	305
31-May-12	1178	305	334

May-12 Monthly Averages

Injection Pressure (psi)

1127

Injection Flow (gpm)

248

Return Flow (gpm)

271

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

31-May-12

1178

305

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

7-May-12

1035

220

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

16-May-12

Injection Flow (gpm)

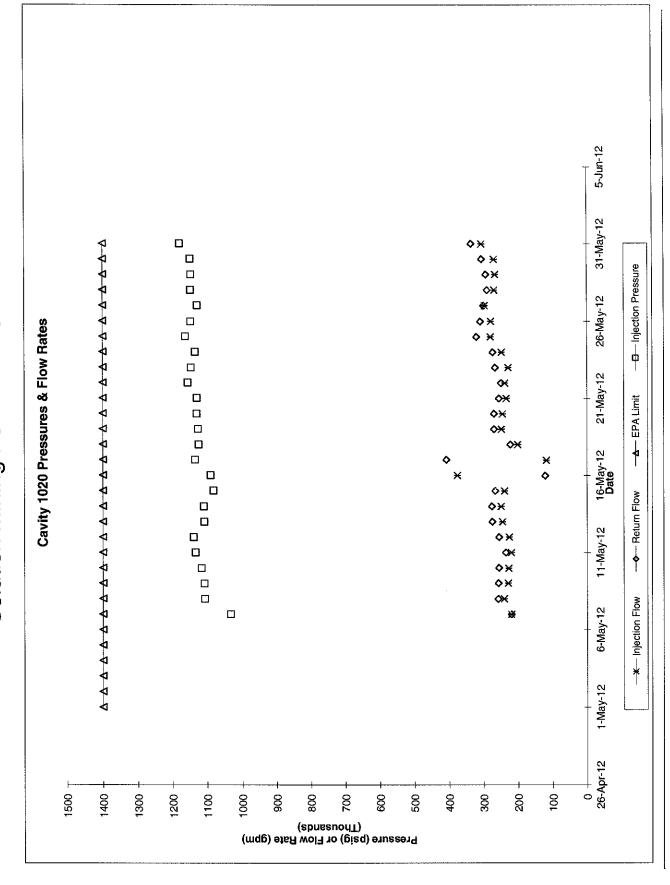
Injection Pressure (psi)

376

1091

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Cavity 1040

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
√1-May-12	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in
7-May-12	shut in	shut in	shut in
8-May-12	shut in	shut in	shut in
9-May-12	shut in	shut in	shut in
10-May-12	shut in	shut in	shut in
11-May-12	shut in	shut in	shut in
12-May-12	shut in	shut in	shut in
13-May-12	shut in	shut in	shut in
14-May-12	shut in	shut in	shut in
15-May-12	shut in	shut in	shut in
16-May-12	shut in	shut in	shut in
17-May-12	shut in	shut in	shut in
18-May-12	shut in	shut in	shut in
19-May-12	shut in	shut in	shut in
20-May-12	shut in	shut in	shut in
21-May-12	shut in	shut in	shut in
22-May-12	shut in	shut in	shut in
23-May-12	shut in	shut in	shut in
24-May-12	shut in	shut in	shut in
25-May-12	shut in	shut in	shut in
26-May-12	shut in	shut in	shut in
27-May-12	shut in	shut in	shut in
28-May-12	shut in	shut in	shut in
29-May-12	shut in	shut in	shut in
30-May-12	shut in	shut in	shut in
31-May-12	shut in	shut in	shut in

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Cavity 1050

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-May-12	1170	145	145
2-May-12	1206	179	179
3-May-12	1206	160	160
4-May-12	1188	157	157
5-May-12	1180	157	157
6-May-12	1175	144	144
7-May-12	1167	180	180
8-May-12	1183	206	206
9-May-12	1190	153	153
10-May-12	1117	142	142
11-May-12	1181	147	147
12-May-12	1184	166	166
13-May-12	/1175	190	190
14-May-12	1250	165	165
15-May-12	1175	153	153
16-May-12	1150	144	144
17-May-12	1158	180	180
18-May-12	1167	142	142
19-May-12	1188	149	149
20-May-12	1163	133	133
21-May-12	1187	156	156
22-May-12	1205	142	142
23-May-12	1200	141	141
24-May-12	1200	155	155
25-May-12	1183	, /220	220
26-May-12	1160	198	198
27-May-12	1198	171	171
28-May-12	1188	142	142
29-May-12	1200	149	149
30-May-12	1199	158	158
31-May-12	1130	176	176

### May-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1181

161

161

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

14-May-12

1250

165

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

10-May-12

1117

142

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

25-May-12

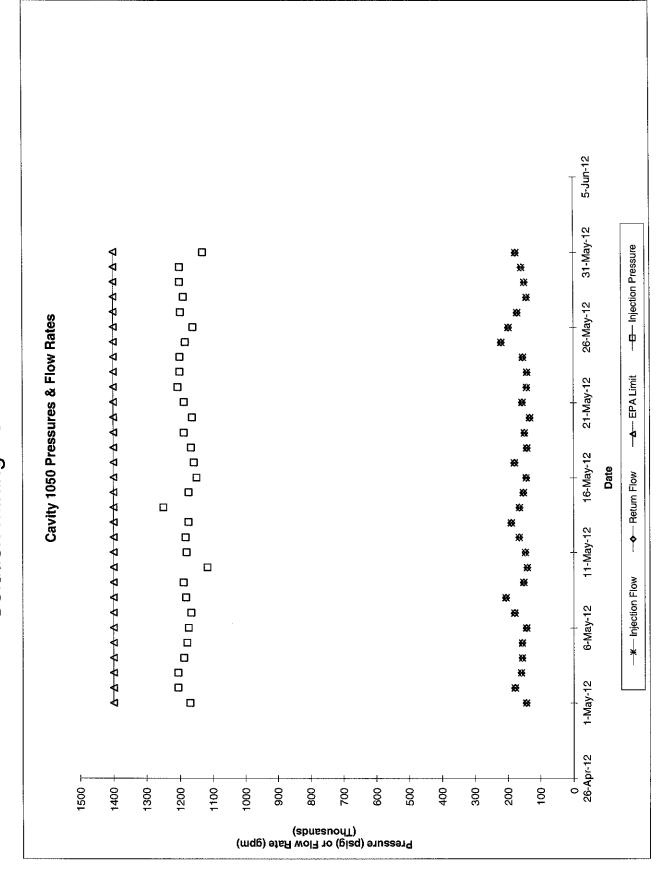
Injection Flow (gpm)

Injection Pressure (psi)

220

1183





Cavity 1060

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-May-12	1139	340	349
2-May-12	1118	347	375
3-May-12	1144	347	350
4-May-12	1150	368	363
5-May-12	1142	355	366
6-May-12	1129	347	370
7-May-12	1030	111	122
8-May-12	shut in	shut in	shut in
9-May-12	shut in	shut in	shut in
10-May-12	shut in	shut in	shut in
11-May-12	shut in	shut in	shut in
12-May-12	shut in	shut in	shut in
13-May-12	shut in	shut in	shut in
14-May-12	shut in	shut in	shut in
15-May-12	shut in	shut in	shut in
16-May-12	shut in	shut in	shut in
17-May-12	shut in	shut in	shut in
18-May-12	shut in	shut in	shut in
19-May-12	shut in	shut in	shut in
20-May-12	shut in	shut in	shut in
21-May-12	shut in	shut in	shut in
22-May-12	shut in	shut in	shut in
23-May-12	shut in	shut in	shut in
24-May-12	shut in	shut in	shut in
25-May-12	shut in	shut in	shut in
26-May-12	shut in	shut in	shut in
27-May-12	shut in	shut in	shut in
28-May-12	shut in	shut in	shut in
29-May-12	shut in	shut in	shut in
30-May-12	shut in	shut in	shut in
31-May-12	shut in	shut in	shut in

May-12 Monthly Averages

Injection Pressure

1122

Injection Flow

316

Return Flow

328

Maximum Injection Pressure and corresponding Injection Flow

Date

4-May-12

Injection Pressure

1150

Injection Flow

368

Minimum Injection Pressure and corresponding Injection Flow

Date

7-May-12

Injection Pressure

1030

Injection Flow

111

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

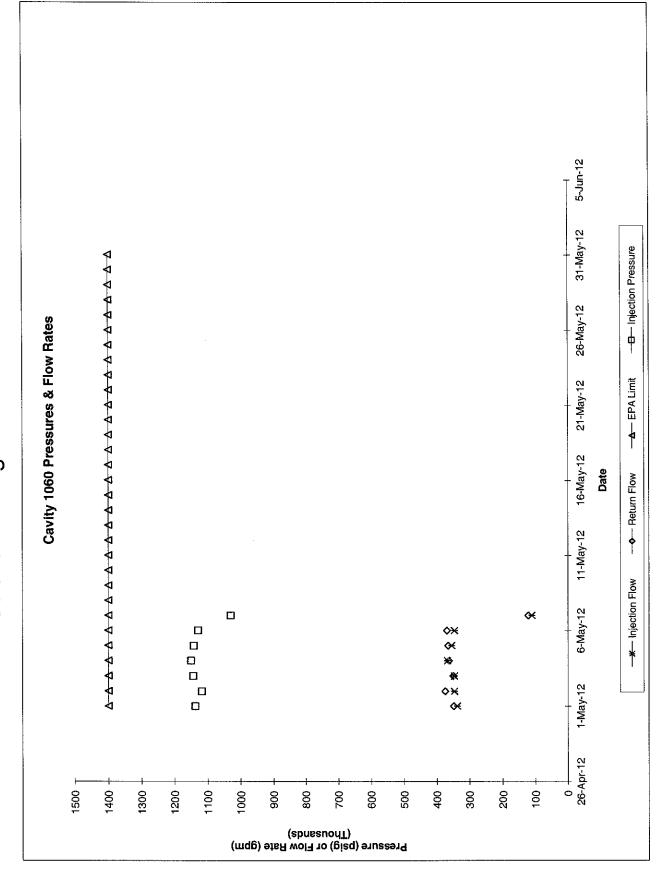
4-May-12

Injection Flow

368

Injection Pressure

1150



### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-May-12	1170	232	232
2-May-12	1208	172	172
3-May-12	1208	190	190
4-May-12	1188	226	226
5-May-12	1173	169	169
6-May-12	1175	225	225
7-May-12	1167	238	238
8-May-12	1183	244	244
9-May-12	1190	V <sub>260</sub>	260
10-May-12	1117	247	247
11-May-12	1181	202	202
12-May-12	1184	228	228
13-May-12	1175	235	235
14-May-12	1250	238	238
15-May-12	1175	195	195
16-May-12	1150	220	220
17-May-12	1158	247	247
18-May-12	1167	211	211
19-May-12	1188	241	241
20-May-12	1163	240	240
21-May-12	1187	231	231
22-May-12	1205	254	254
23-May-12	1200	208	208
24-May-12	1200	229	229
25-May-12	1183	177	177
26-May-12	1160	235	235
27-May-12	1198	250	250
28-May-12	1188	215	215
29-May-12	1200	222	222
30-May-12	1199	257	257
31-May-12	1130	226	226



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May-12 Monthly Averages

Injection Pressure (psi)

1181

Injection Flow (gpm)

225

Return Flow (gpm)

225

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

14-May-12

1250

238

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

10-May-12

1117

247

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

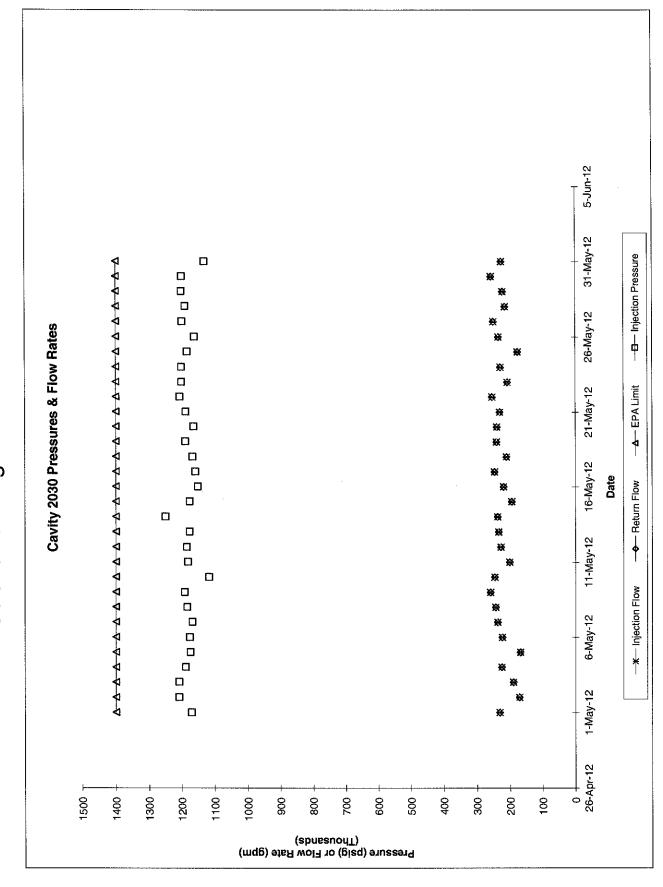
Injection Flow (gpm)

Injection Pressure (psi)

9-May-12

260

1190



#### Cavity 2040

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-May-12	shut in	shut in	shut in
2-May-12	shut in	shut in	shut in
3-May-12	shut in	shut in	shut in
4-May-12	shut in	shut in	shut in
5-May-12	shut in	shut in	shut in
6-May-12	shut in	shut in	shut in
7-May-12	shut in	shut in	shut in
8-May-12	shut in	shut in	shut in
9-May-12	shut in	shut in	shut in
10-May-12	shut in	shut in	shut in
11-May-12	shut in	shut in	shut in
12-May-12	shut in	shut in	shut in
13-May-12	shut in	shut in	shut in
14-May-12	shut in	shut in	shut in
15-May-12	shut in	shut in	shut in
16-May-12	shut in	shut in	shut in
17-May-12	shut in	shut in	shut in
18-May-12	shut in	shut in	shut in
19-May-12	shut in	shut in	shut in
20-May-12	shut in	shut in	shut in
21-May-12	shut in	shut in	shut in
22-May-12	shut in	shut in	shut in
23-May-12	shut in	shut in	shut in
24-May-12	shut in	shut in	shut in
25-May-12	shut in	shut in	shut in
26-May-12	shut in	shut in	shut in
27-May-12	shut in	shut in	shut in
28-May-12	shut in	shut in	shut in
29-May-12	shut in	shut in	shut in
30-May-12	shut in	shut in	shut in
31-May-12	shut in	shut in	shut in
	1	and the same of th	



JUN 1 3 2012

Cavity 2061

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-May-12	shut in	shut in	shut in
2-May-12	1200	0	74
3-May-12	1208	69	69
4-May-12	1188	106	106
5-May-12	1180	111	111
6-May-12	1175	102	102
7-May-12	1167	137	137
8-May-12	1188	51	51
9-May-12	1150	72	72
10-May-12	1117	127	127
11-May-12	1181	<b>161</b>	161
12-May-12	1184	123	123
13-May-12	1175	92	92
14-May-12	V 1250	90	90
15-May-12	1175	88	88
16-May-12	1150	94	94
17-May-12	1158	81	81
18-May-12	1167	97	97
19-May-12	1188	111	111
20-May-12	1163	107	107
21-May-12	1187	103	103
22-May-12	1205	130	130
23-May-12	1200	98	98
24-May-12	1200	87	87
25-May-12	shut in	shut in	shut in
26-May-12	shut in	shut in	shut in
27-May-12	shut in	shut in	shut in
28-May-12	1188	71	71
29-May-12	1200	61	61
30-May-12	1199	112	112
31-May-12	1130	145	145

#### Cavity 2061

May-12 Monthly Averages

Injection Pressure (psi)

1180

Injection Flow (gpm)

97

Return Flow (gpm)

100

Maximum Injection Pressure and corresponding Injection Flow

Date 14-May-12 Injection Pressure (psi)

Injection Flow (gpm)

1250

90

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

10-May-12

1117

127

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

11-May-12

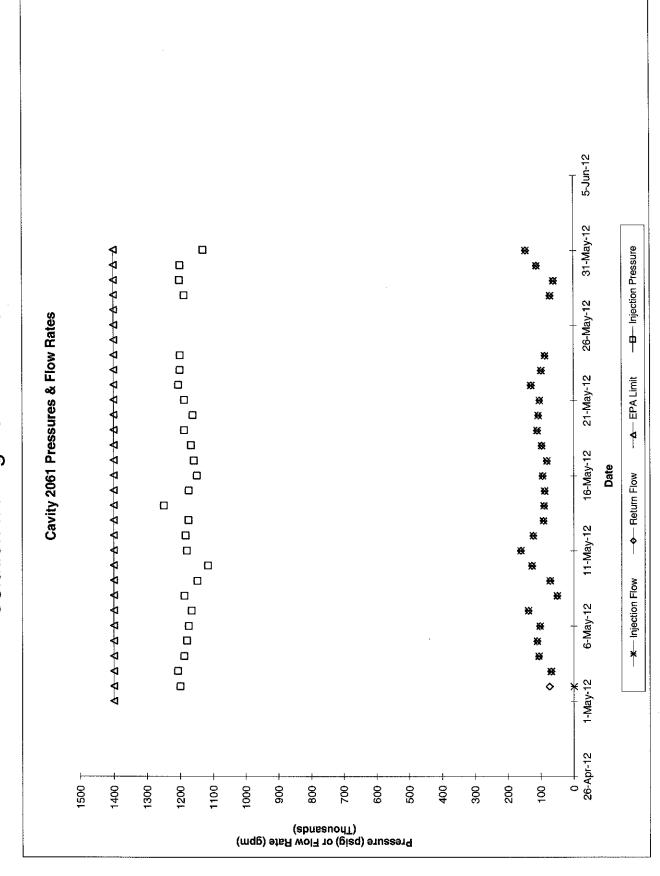
Injection Flow (psi) 161

1

Injection Pressure (psi)

1181





## CAVITY 2062

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#### Cavity 2062

#### Daily Averages

Date         Pressure (psi)         Flow (gpm)         Flow (gpm)           1-May-12         shut in shut		Injection	Injection	Return
(psi)         (gpm)         (g           1-May-12         shut in         shut in         shut in           2-May-12         shut in         shut in         shut in           3-May-12         shut in         shut in         shut in           4-May-12         shut in         shut in         shut in           5-May-12         shut in         shut in         shut in           6-May-12         shut in         shut in         shut in           8-May-12         shut in         shut in         shut in           9-May-12         shut in         shut in         shut in           10-May-12         shut in         shut in         shut in           11-May-12         shut in         shut in         shut in           13-May-12         shut in         shut in         shut in           14-May-12         shut in         shut in         shut in           15-May-12         shut in         shut in         shut in           16-May-12         shut in         shut in         shut in           18-May-12         shut in         shut in         shut in           18-May-12         shut in         shut in         shut in           20-May-12<	Doto			Flow
1-May-12 shut in shut in shat	Date			(gpm)
2-May-12 shut in shut	1 1/20/12			shut in
3-May-12 shut in shut	And the second s			shut in
4-May-12 shut in shut in sl 5-May-12 shut in shut in sl 6-May-12 shut in shut in sl 7-May-12 shut in shut in sl 8-May-12 shut in shut in sl 9-May-12 shut in shut in sl 10-May-12 shut in shut in sl 11-May-12 shut in shut in sl 11-May-12 shut in shut in sl 13-May-12 shut in shut in sl 14-May-12 shut in shut in sl 15-May-12 shut in shut in sl 16-May-12 shut in shut in sl 17-May-12 shut in shut in sl 18-May-12 shut in shut in sl 19-May-12 shut in shut in sl 19-May-12 shut in shut in sl 19-May-12 shut in shut in sl 20-May-12 shut in shut in sl 21-May-12 shut in shut in sl 22-May-12 shut in shut in sl 23-May-12 shut in shut in sl 24-May-12 shut in shut in sl 25-May-12 shut in shut in sl 26-May-12 shut in shut in sl 27-May-12 shut in shut in sl 27-May-12 shut in shut in sl 28-May-12 shut in shut in sl 29-May-12 shut in shut				shut in
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15-May-12 shut in shut				shut in
16-May-12 shut in shut	•			shut in
17-May-12       shut in       shut in       shut in         18-May-12       shut in       shut in       shut in         19-May-12       shut in       shut in       shut in         20-May-12       shut in       shut in       shut in         21-May-12       shut in       shut in       shut in         23-May-12       shut in       shut in       shut in         24-May-12       shut in       shut in       shut in         25-May-12       shut in       shut in       shut in         26-May-12       shut in       shut in       shut in         28-May-12       shut in       shut in       shut in         29-May-12       shut in       shut in       shut in	15-May-12			shut in
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19-May-12       shut in       shut in       s         20-May-12       shut in       shut in       s         21-May-12       shut in       shut in       s         22-May-12       shut in       shut in       s         23-May-12       shut in       shut in       s         24-May-12       shut in       shut in       s         25-May-12       shut in       shut in       s         26-May-12       shut in       shut in       s         27-May-12       shut in       shut in       s         28-May-12       shut in       shut in       shut in         29-May-12       shut in       shut in       shut in	17-May-12	shut in		shut in
20-May-12       shut in       shut in       shut in         21-May-12       shut in       shut in       shut in         22-May-12       shut in       shut in       shut in         23-May-12       shut in       shut in       shut in         24-May-12       shut in       shut in       shut in         25-May-12       shut in       shut in       shut in         26-May-12       shut in       shut in       shut in         27-May-12       shut in       shut in       shut in         28-May-12       shut in       shut in       shut in         29-May-12       shut in       shut in       shut in	18-May-12	shut in	shut in	shut in
21-May-12       shut in       shut in         22-May-12       shut in       shut in         23-May-12       shut in       shut in         24-May-12       shut in       shut in         25-May-12       shut in       shut in         26-May-12       shut in       shut in         27-May-12       shut in       shut in         28-May-12       shut in       shut in         29-May-12       shut in       shut in	19-May-12	shut in	shut in	shut in
22-May-12       shut in       shut in         23-May-12       shut in       shut in         24-May-12       shut in       shut in         25-May-12       shut in       shut in         26-May-12       shut in       shut in         27-May-12       shut in       shut in         28-May-12       shut in       shut in         29-May-12       shut in       shut in	20-May-12	shut in	shut in	shut in
23-May-12       shut in       shut in         24-May-12       shut in       shut in         25-May-12       shut in       shut in         26-May-12       shut in       shut in         27-May-12       shut in       shut in         28-May-12       shut in       shut in         29-May-12       shut in       shut in	21-May-12	shut in	shut in	shut in
24-May-12       shut in       shut in       s         25-May-12       shut in       shut in       s         26-May-12       shut in       shut in       s         27-May-12       shut in       shut in       s         28-May-12       shut in       shut in       s         29-May-12       shut in       shut in       s	22-May-12	shut in	shut in	shut in
25-May-12       shut in       shut in         26-May-12       shut in       shut in         27-May-12       shut in       shut in         28-May-12       shut in       shut in         29-May-12       shut in       shut in	23-May-12	shut in	shut in	shut in
26-May-12       shut in       shut in         27-May-12       shut in       shut in         28-May-12       shut in       shut in         29-May-12       shut in       shut in	24-May-12	shut in	shut in	shut in
27-May-12 shut in shut in s 28-May-12 shut in shut in s 29-May-12 shut in shut in s	25-May-12	shut in	shut in	shut in
28-May-12 shut in shut in s 29-May-12 shut in shut in s	26-May-12	shut in	shut in	shut in
28-May-12 shut in shut in shut in shut in shut in	27-May-12	shut in	shut in	shut in
29-May-12 shut in shut in		shut in	shut in	shut in
The state of the s		shut in	shut in	shut in
Structus Structus	30-May-12	shut in	shut in	shut in
		shut in	shut in	shut in



May 10, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: L

Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for April 2012 MAY 1 4 2012

UIC BRANCH

EPA, REGION 5

During the month of April, Mosaic Potash solution well operations were as follows:

- Cavity KCl 1010 was not in operation for this month.
- Cavity KCl 1020 was in operation for 9 days this month.
- Cavity KCl 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 30 days this month.
- Cavity KCI 1060 was in operation for 22 days this month.
- Cavity KCl 2030 was in operation for 30 days this month.
- Cavity KCl 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 28 days this month.
- Cavity KCl 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- 2. Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Dou'g Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments



MAY 1 4 2012

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MAY 1 4 2012

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Cavity 1010

Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Apr-12	shut in	shut in	shut in
2-Apr-12	shut in	shut in	shut in
3-Apr-12	shut in	shut in	shut in
4-Apr-12	shut in	shut in	shut in
5-Apr-12	shut in	shut in	shut in
6-Apr-12	shut in	shut in	shut in
7-Apr-12	shut in	shut in	shut in
8-Apr-12	shut in	shut in	shut in
9-Apr-12	shut in	shut in	shut in
10-Apr-12	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in

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MAY 1 4 2012

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CAVITY 1020 -



Cavity 1020

Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
. /	(psi)	(gpm)	(gpm)
1-Apr-12	1097	251	255
2-Apr-12	1144	294	312
3-Apr-12	1126	308	310
4-Apr-12	1120	339	333
5-Apr-12	1140	79	81
6-Apr-12	1130	216	213
7-Apr-12	1153	331	314
8-Apr-12	1159	339	346
9-Apr-12	1150	80	74
10-Apr-12	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in



Cavity 1020

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Apr-12 ✓ Monthly Averages

Injection Pressure (psi)

1135

Injection Flow (gpm)

249

Return Flow (gpm)

249

Maximum Injection Pressure and corresponding Injection Flow

Date 8-Apr-12 Injection Pressure (psi)

Injection Flow (gpm)

1159

339

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

1-Apr-12

1097

251

Date

4-Apr-12

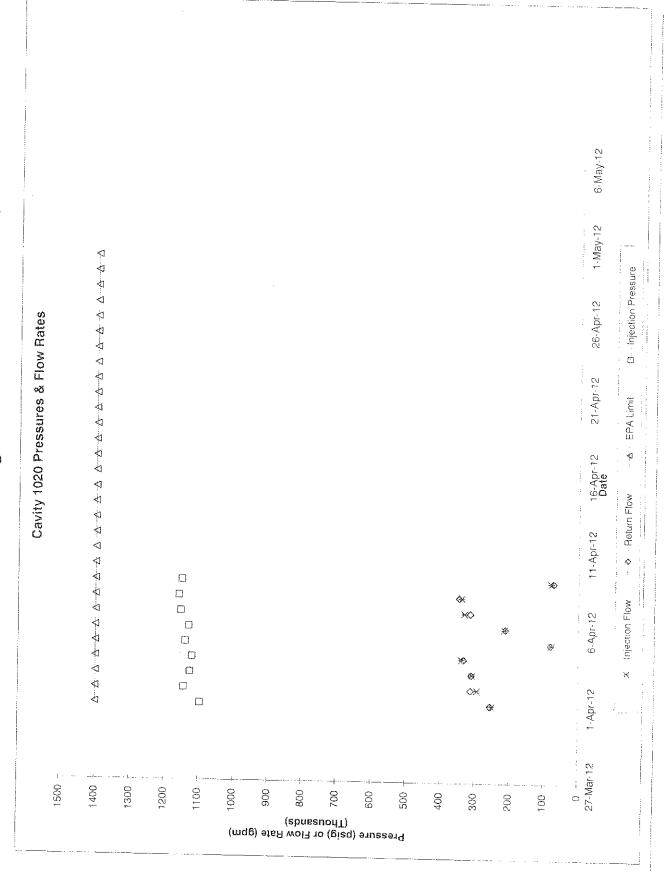
Injection Flow (gpm)

Maximum Injection Flow Rate and corresponding Injection Pressure

Injection Pressure (psi)

339

1120



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CAVITY 1040 /



Cavity 1040

### UIC BRANCH EPA, REGION 5

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Apr-12	shut in	shut in	shut in
2-Apr-12	shut in	shut in	shut in
3-Apr-12	shut in	shut in	shut in
4-Apr-12	shut in	shut in	shut in
5-Apr-12	shut in	shut in	shut in
6-Apr-12	shut in	shut in	shut in
7-Apr-12	shut in	shut in	shut in
8-Apr-12	shut in	shut in	shut in
9-Apr-12	shut in	shut in	shut in
10-Apr-12	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in

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MAY 1 4 2012

UIO BRANCH EPA REGIONS



Cavity 1050

### UIC BRANCH EPA, REGION 5

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return
	(psi)	(gpm)	(gpm)
1/Apr-12	1216	139	139
2-Apr-12	1200	170	170
3-Apr-12	1188 🗸	193	193
4-Apr-12	1238	182	182
5-Apr-12	1200	90	90
6-Apr-12	1200	116	116
7-Apr-12	1188	130	130
8-Apr-12	1190	146	146
9-Apr-12	1164	147	147
10-Apr-12	1194	150	150
11-Apr-12	1113	145	145
12-Apr-12	1228	152	152
13-Apr-12	1180	71	71
14-Apr-12	1206	153	153
15-Apr-12	1206	205	205
16-Apr-12	1200	209	209
17-Apr-12	1167	205	205
18-Apr-12	1183	209	209
19-Apr-12	1192	208	208
20-Apr-12	1180	144	144
21-Apr-12	1220	112	112
22-Apr-12	1200	229 /	229
23-Apr-12	1206	216	216
24-Apr-12	1183	219	219
25-Apr-12	1195	159	159
26-Apr-12	1185	128	128
27-Apr-12	1163	180	180
28-Apr-12	1213	158	158
29-Apr-12	1150	144	144
30-Apr-12	1185	144	144



## UIC BRANCH EPA, REGION 5

Cavity 1050

Apr-12 Monthly Averages

Injection Pressure (psi)

1191

Injection Flow (gpm)

162

Return Flow (gpm)

162

Maximum Injection Pressure and corresponding Injection Flow

Date

4-Apr-12

Injection Pressure (psi)

1238

Injection Flow (gpm)

182

Minimum Injection Pressure and corresponding Injection Flow

Date 11-Apr-12 Injection Pressure (psi)

Injection Flow (gpm)

1

1113

145

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

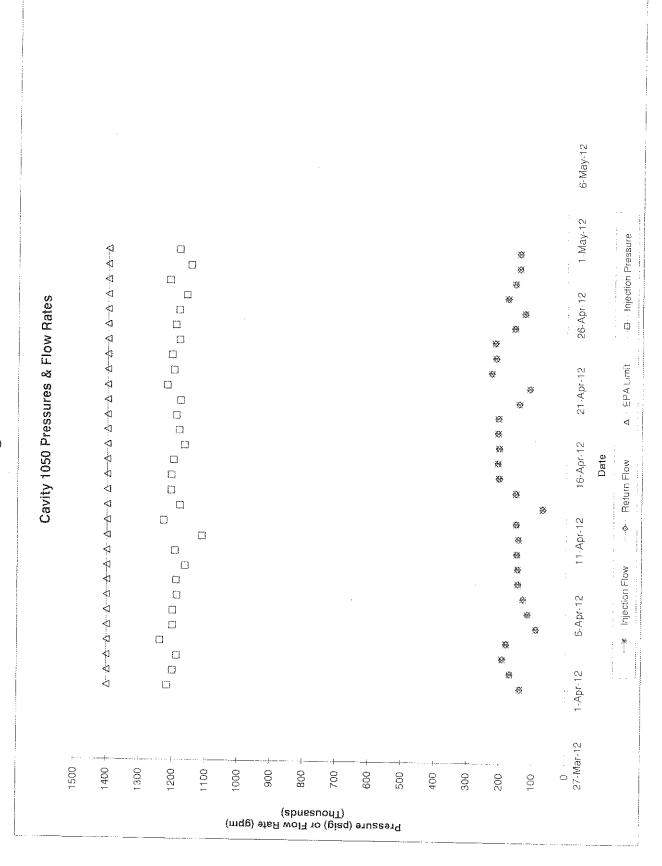
22-Apr-12

Injection Flow (gpm)

229

Injection Pressure (psi)

1200





Cavity 1060

UIC BRANCH EPA, REGION 5

#### Daily Averages

Date	Injection Pressure	Injection Flow (gom)	Return Flow
1-Apr-12	(psi) shut in	(gpm) shut in	(gpm) shut in
2-Apr-12	shut in	shut in	shut in
3-Apr-12	shut in	shut in	shut in
	shut in	shut in	shut in
4-Apr-12	shut in	shut in	shut in
5-Apr-12		shut in	shut in
6-Apr-12	shut in	shut in	shut in
7-Apr-12	shut in		
8-Apr-12	shut in	shut in	shut in
9-Apr-12	1064	295	302
10-Apr-12	1068	292	280
11-Apr-12	1075	285	282
12-Apr-12	1092	285	314
13-Apr-12	1119	319	305
14-Apr-12	1173	333	355
15-Apr-12	1146	347	388
16-Apr-12	1141	375 🗸	394
17-Apr-12	1133	368	384
18-Apr-12	1135	368	380
19-Apr-12	1132	361	372
20-Apr-12	1130	299	291
21-Apr-12	1167	299	292
22-Apr-12	1138	354	391
23-Apr-12	1116	368	393
24-Apr-12	1110	375	391
25-Apr-12	1091	361	374
26-Apr-12	1125	375	383
27-Apr-12	1065	354	360
28-Apr-12	1147	354	354
29-Apr-12	1156	361	368
30-Apr-12	1137	333	341



Cavity 1060

UIC BRANCH EPA, REGION 5

Apr-12 Monthly Averages

Injection Pressure

1121

Injection Flow

339

Return Flow

350

Maximum Injection Pressure and corresponding Injection Flow

Date

14-Apr-12

Injection Pressure

1173

Injection Flow

333

Minimum Injection Pressure and corresponding Injection Flow

Date

9-Apr-12

Injection Pressure

1064

Injection Flow

295

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

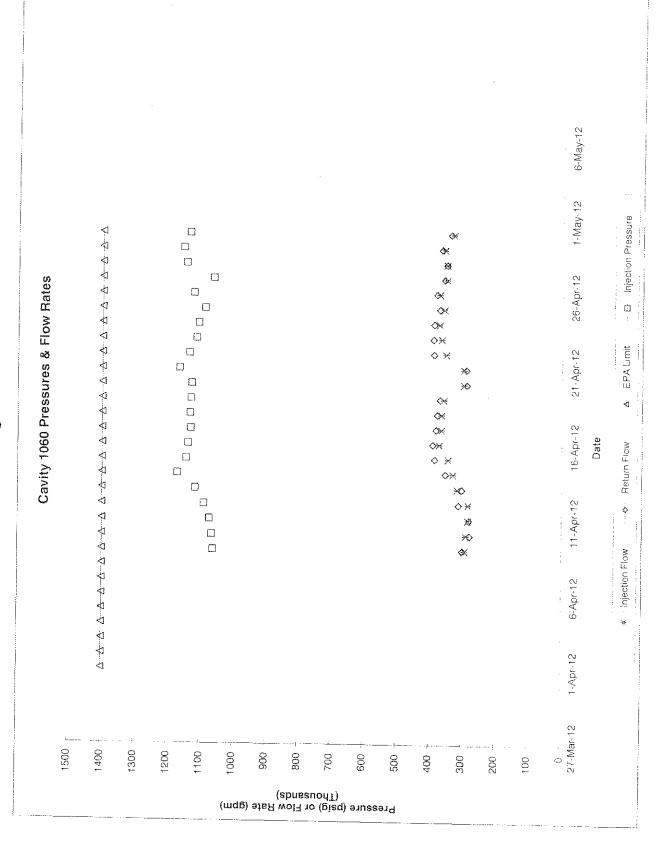
16-Apr-12

Injection Flow

375

Injection Pressure

1141



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CAVITY 2030 V



Cavity 2030

Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Apr-12	1216	216	216
2-Apr-12	1200	241	241
3-Apr-12	1188	232	232
4-Apr-12	1238	203	203
5-Apr-12	1183	277	277
6-Apr-12	1183	308	308
7-Apr-12	1188	294	294
8-Apr-12	1190	292	292
9-Apr-12	1194	269	269
10-Apr-12	1194	259	259
11-Apr-12	1113	264	264
12-Apr-12	1228	286	286
13-Apr-12	1181	306	306
14-Apr-12	1206	318 🗸	318
15-Apr-12	1206	249	249
16-Apr-12	1200	265	265
17-Apr-12	1167	272	272
18-Apr-12	1183	288	288
19-Apr-12	1192	236	236
20-Apr-12	1180	241	241
21-Apr-12	1207	234	234
22-Apr-12	1200	293	293
23-Apr-12	1206	268	268
24-Apr-12	1183	151	151
25-Apr-12	1195	280	280
26-Apr-12	1185	248	248
27-Apr-12	1163	271	271
28-Apr-12	1213	194	194
29-Apr-12	1150	219	219
30-Apr-12	1180	182	182





EPA, REGION 5

Cavity 2030 V

Apr-12 Monthly Averages

Injection Pressure (psi)

1190

Injection Flow (gpm)

255

Return Flow (gpm)

255

Maximum Injection Pressure and corresponding Injection Flow

Date 4-Apr-12 Injection Pressure (psi)

Injection Flow (gpm)

1238

203

Minimum Injection Pressure and corresponding Injection Flow

Injection Pressure (psi)

Injection Flow (gpm)

11-Apr-12

1113

264

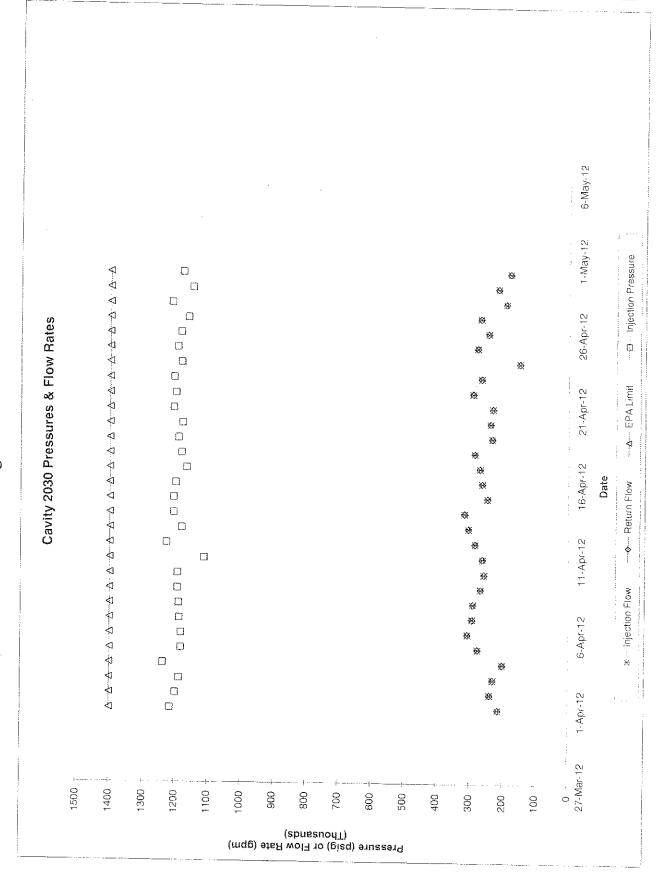
Maximum Injection Flow Rate and corresponding Injection Pressure

Date 14-Apr-12

Injection Flow (gpm)

Injection Pressure (psi)

1206





Cavity 2040

Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Apr-12	shut in	shut in	shut in
2-Apr-12	shut in	shut in	shut in
3-Apr-12	shut in	shut in	shut in
4-Apr-12	shut in	shut in	shut in
5-Apr-12	shut in	shut in	shut in
6-Apr-12	shut in	shut in	shut in
7-Apr-12	shut in	shut in	shut in
8-Apr-12	shut in	shut in	shut in
9-Apr-12	shut in	shut in	shut in
10-Apr-12	shut in	shut in	shut in
11-Apr-12	shut in	shut in	shut in
12-Apr-12	shut in	shut in	shut in
13-Apr-12	shut in	shut in	shut in
14-Apr-12	shut in	shut in	shut in
15-Apr-12	shut in	shut in	shut in
16-Apr-12	shut in	shut in	shut in
17-Apr-12	shut in	shut in	shut in
18-Apr-12	shut in	shut in	shut in
19-Apr-12	shut in	shut in	shut in
20-Apr-12	shut in	shut in	shut in
21-Apr-12	shut in	shut in	shut in
22-Apr-12	shut in	shut in	shut in
23-Apr-12	shut in	shut in	shut in
24-Apr-12	shut in	shut in	shut in
25-Apr-12	shut in	shut in	shut in
26-Apr-12	shut in	shut in	shut in
27-Apr-12	shut in	shut in	shut in
28-Apr-12	shut in	shut in	shut in
29-Apr-12	shut in	shut in	shut in
30-Apr-12	shut in	shut in	shut in

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Cavity 2061

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Apr-12	1216	121	121
2-Apr-12	1200	60	60
3-Apr-12	1200	18	18
4-Apr-12	shut in	shut in	shut in
5-Apr-12	1175	193	193
6-Apr-12	1183	216	216
7-Apr-12	1188	98	98
8-Apr-12	1190	99	99
9-Apr-12	1194	125	125
10-Apr-12	1192	99	99
11-Apr-12	1113	116	116
12-Apr-12	1203	62	62
13-Apr-12	1168	51	51
14-Apr-12	shut in	shut in	shut in
15-Apr-12	1208	109	109
16-Apr-12	1200	121	121
17-Apr-12	1167	88	88
18-Apr-12	1183	79	79
19-Apr-12	1192	94	94
20-Apr-12	1180	72	72
21-Apr-12	1220 V	80	80
22-Apr-12	1200	94	94
23-Apr-12	1206	141	141
24-Apr-12	1183	155	155
25-Apr-12	1195	113	113
26-Apr-12	1185	84	84
27-Apr-12	1163	113	113
28-Apr-12	1213	103	103
29-Apr-12	1150	107	107
30-Apr-12	1180	57	57



Cavity 2061

UIC BRANCH EPA, REGION 5

Apr-12 Monthly Averages

Injection Pressure (psi)

1187

Injection Flow (gpm)

102

Return Flow (gpm)

102

Maximum Injection Pressure and corresponding Injection Flow

Date 21-Apr-12 Injection Pressure (psi)

Injection Flow (gpm)

80

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

11-Apr-12

1111

116

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

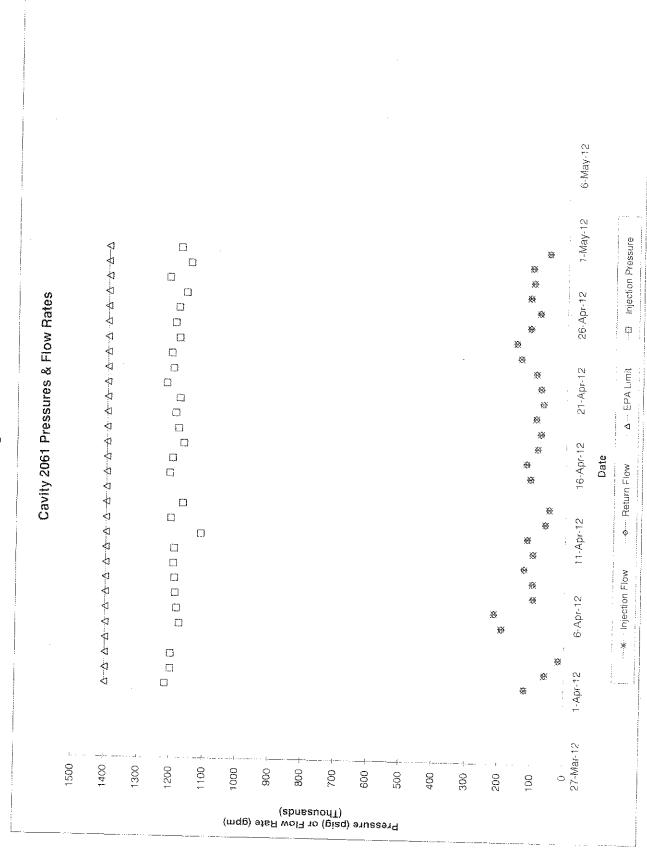
6-Apr-12

Injection Flow (psi)

216

Injection Pressure (psi)

1183



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CAVITY 2062

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Cavity 2062

Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Apr-12	shut in	shut in	shut in	
2-Apr-12	shut in	shut in	shut in	
3-Apr-12	shut in	shut in	shut in	
4-Apr-12	shut in	shut in	shut in	
5-Apr-12	shut in	shut in	shut in	
6-Apr-12	shut in	shut in	shut in	
7-Apr-12	shut in	shut in	shut in	
8-Apr-12	shut in	shut in	shut in	
9-Apr-12	shut in	shut in	shut in	
10-Apr-12	shut in	shut in	shut in	
11-Apr-12	shut in	shut in	shut in	
12-Apr-12	shut in	shut in	shut in	
13-Apr-12	shut in	shut in	shut in	
14-Apr-12	shut in	shut in	shut in	
15-Apr-12	shut in	shut in	shut in	
16-Apr-12	shut in	shut in	shut in	
17-Apr-12	shut in	shut in	shut in	
18-Apr-12	shut in	shut in	shut in	
19-Apr-12	shut in	shut in	shut in	
20-Apr-12	shut in	shut in	shut in	
21-Apr-12	shut in	shut in	shut in	
22-Apr-12	shut in	shut in	shut in	
23-Apr-12	shut in	shut in	shut in	
24-Apr-12	shut in	shut in	shut in	
25-Apr-12	shut in	shut in	shut in	
26-Apr-12	shut in	shut in	shut in	
27-Apr-12	shut in	shut in	shut in	
28-Apr-12	shut in	shut in	shut in	
29-Apr-12	shut in	shut in	shut in	
30-Apr-12	shut in	shut in	shut in	
1-May-12	shut in	shut in	shut in	



April 12, 2012



APR 1 9 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604



Attn:

Lisa Perenchio

RE:

Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for March 2012

During the month of March, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 10 days this month.
- Cavity KCl 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 29 days this month.
- Cavity KCI 1060 was in operation for 26 days this month.
- Cavity KCI 2030 was in operation for 29 days this month.
- Cavity KCl 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 28 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- 2. Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments

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#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Mar-12	shut in	shut in	shut in	
2-Mar-12	shut in	shut in	shut in	
3-Mar-12	shut in	shut in	shut in	
4-Mar-12	shut in	shut in	shut in	
5-Mar-12	shut in	shut in	shut in	
6-Mar-12	shut in	shut in	shut in	
7-Mar-12	shut in	shut in	shut in	
8-Mar-12	shut in	shut in	shut in	
9-Mar-12	shut in	shut in	shut in	
10-Mar-12	shut in	shut in	shut in	
11-Mar-12	shut in	shut in	shut in	
12-Mar-12	shut in	shut in	shut in	
13-Mar-12	shut in	shut in	shut in	
14-Mar-12	shut in	shut in	shut in	
15-Mar-12	shut in	shut in	shut in	
16-Mar-12	shut in	shut in	shut in	
17-Mar-12	shut in	shut in	shut in	
18-Mar-12	shut in	shut in	shut in	
19-Mar-12	shut in	shut in	shut in	
20-Mar-12	shut in	shut in	shut in	
21-Mar-12	shut in	shut in	shut in	
22-Mar-12	shut in	shut in	shut in	
23-Mar-12	shut in	shut in	shut in	
24-Mar-12	shut in	shut in	shut in	
25-Mar-12	shut in	shut in	shut in	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	shut in	shut in	shut in	
29-Mar-12	shut in	shut in	shut in	
30-Mar-12	shut in	shut in	shut in	
31-Mar-12	shut in	shut in	shut in	

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Cavity 1020

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow (gpm)	
	(psi)	(gpm)		
1-Mar-12	1141	374	361	
2-Mar-12	1137	. 386	381	
3-Mar-12	1148	382	375	
4-Mar-12	1143	351	356	
5-Mar-12	V1169	327	295	
6-Mar-12	1025	191	201	
7-Mar-12	1040	204	202	
8-Mar-12	1052	196	202	
9-Mar-12	1086	181	176	
10-Mar-12	1110	167	160	
11-Mar-12	shut in	shut in	shut in	
12-Mar-12	shut in	shut in	shut in	
13-Mar-12	shut in	shut in	shut in	
14-Mar-12	shut in	shut in	shut in	
15-Mar-12	shut in	shut in	shut in	
16-Mar-12	shut in	shut in	shut in	
17-Mar-12	shut in	shut in	shut in	
18-Mar-12	shut in	shut in	shut in	
19-Mar-12	shut in	shut in	shut in	
20-Mar-12	shut in	shut in	shut in	
21-Mar-12	shut in	shut in	shut in	
22-Mar-12	shut in	shut in	shut in	
23-Mar-12	shut in	shut in	shut in	
24-Mar-12	shut in	shut in	shut in	
25-Mar-12	shut in	shut in	shut in	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	shut in	shut in	shut in	
29-Mar-12	shut in	shut in	shut in	
30-Mar-12	1160	0	0	
31-Mar-12	1139	215	224	

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Mar-12 Monthly Averages

Injection Pressure (psi)

1113

Injection Flow (gpm)

248

Return Flow (gpm)

244

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

5-Mar-12

1169

327

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Mar-12

1025

191

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

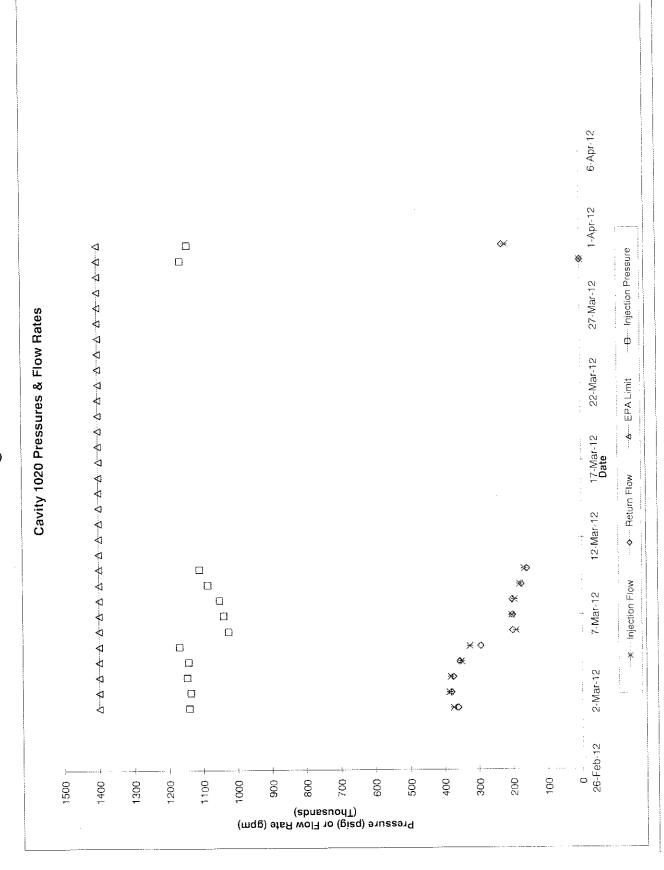
2-Mar-12

386

1137



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#### Daily Averages

Date   Pressure (psi)   (ppm)   (ppm	Return
(psi)         (gpm)           1-Mar-12         shut in         shut in           2-Mar-12         shut in         shut in           3-Mar-12         shut in         shut in           4-Mar-12         shut in         shut in           5-Mar-12         shut in         shut in           6-Mar-12         shut in         shut in           7-Mar-12         shut in         shut in           8-Mar-12         shut in         shut in           9-Mar-12         shut in         shut in           10-Mar-12         shut in         shut in           11-Mar-12         shut in         shut in           13-Mar-12         shut in         shut in	
1-Mar-12 shut in shut	Flow
2-Mar-12 shut in shut in shut in 4-Mar-12 shut in shut in shut in 5-Mar-12 shut in shut in 6-Mar-12 shut in shut in shut in 7-Mar-12 shut in shut in shut in shut in 9-Mar-12 shut in shut in shut in 10-Mar-12 shut in shut i	(gpm)
3-Mar-12 shut in shut in shut in 5-Mar-12 shut in shut in 5-Mar-12 shut in shut in 6-Mar-12 shut in shut in 7-Mar-12 shut in shut in shut in 8-Mar-12 shut in shut in 9-Mar-12 shut in shut in shut in 10-Mar-12 shut in shut in shut in 11-Mar-12 shut in shut in shut in 11-Mar-12 shut in shut in shut in 13-Mar-12 shut in	shut in
4-Mar-12 shut in shut in shut in 6-Mar-12 shut in shut in 7-Mar-12 shut in shut in shut in 8-Mar-12 shut in shut in shut in 9-Mar-12 shut in shut in shut in 10-Mar-12 shut in shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in shut in 13-Mar-12 shut in	shut in
5-Mar-12 shut in shut in 6-Mar-12 shut in shut in 7-Mar-12 shut in shut in 8-Mar-12 shut in shut in 9-Mar-12 shut in shut in 10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
6-Mar-12 shut in shut in 7-Mar-12 shut in shut in 8-Mar-12 shut in shut in 9-Mar-12 shut in shut in 10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
7-Mar-12 shut in shut in 8-Mar-12 shut in shut in 9-Mar-12 shut in shut in 10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in	shut in
8-Mar-12 shut in shut in 9-Mar-12 shut in shut in 10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
9-Mar-12 shut in shut in 10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
10-Mar-12 shut in shut in 11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in shut in	shut in
11-Mar-12 shut in shut in 12-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
12-Mar-12 shut in shut in 13-Mar-12 shut in shut in	shut in
13-Mar-12 shut in shut in	shut in
	shut in
14-Mar-12 shut in shut in	shut in
	shut in
15-Mar-12 shut in shut in	shut in
16-Mar-12 shut in shut in	shut in
17-Mar-12 shut in shut in	shut in
18-Mar-12 shut in shut in	shut in
19-Mar-12 shut in shut in	shut in
20-Mar-12 shut in shut in	shut in
21-Mar-12 shut in shut in	shut in
22-Mar-12 shut in shut in	shut in
23-Mar-12 shut in shut in	shut in
24-Mar-12 shut in shut in	shut in
25-Mar-12 shut in shut in	shut in
26-Mar-12 shut in shut in	shut in
27-Mar-12 shut in shut in	shut in
28-Mar-12 shut in shut in	shut in
29-Mar-12 shut in shut in	shut in
30-Mar-12 shut in shut in	shut in
31-Mar-12 shut in shut in	shut in

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#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Mar-12	1178	187	187	
2-Mar-12	1203	182	182	
3-Mar-12	1200	191	191	
4-Mar-12	1193	194	194	
5-Mar-12	1187	176	176	
6-Mar-12	1173	161	161	
7-Mar-12	1210	179	179	
8-Mar-12	1207	184	184	
9-Mar-12	1200	166	166	
10-Mar-12	1173	166	166	
11-Mar-12	1187	V 210	210	
12-Mar-12	1180	177	177	
13-Mar-12	1176	181	181	
14-Mar-12	1215	180	180	
15-Mar-12	1183	181	181	
16-Mar-12	1175	184	184	
17-Mar-12	1210	175	175	
18-Mar-12	1200	167	167	
19-Mar-12	1168	157	157	
20-Mar-12	1200	182	182	
21-Mar-12	1200	181	181	
22-Mar-12	1213	179	179	
23-Mar-12	1200	188	188	
24-Mar-12	1175	185	185	
25-Mar-12	1180	61	61	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	1300	37	37	
29-Mar-12	1200	58	58	
30-Mar-12	1230	166	166	
31-Mar-12	1204	145	145	

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Mar-12 Monthly Averages

Injection Pressure (psi)

1197

Injection Flow (gpm)

165

Return Flow (gpm)

165

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

28-Mar-12

1300

37

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

19-Mar-12

1168

157

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

11-Mar-12

Injection Flow (gpm)

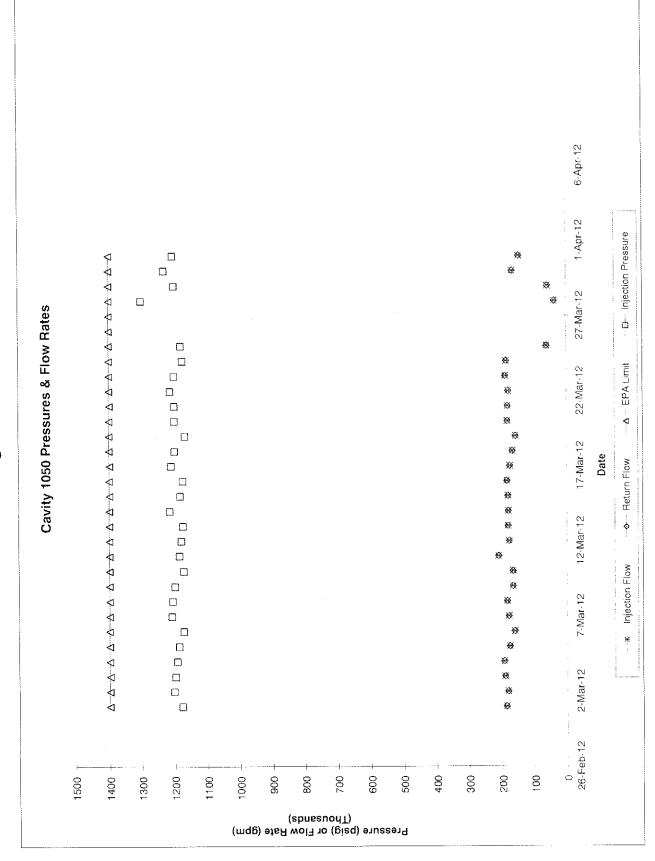
Injection Pressure (psi)

210

1187



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Cavity 1060

#### Daily Averages

	passes and the same of the sam			
	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Mar-12	shut in	shut in	shut in	
2-Mar-12	shut in	shut in	shut in	
3-Mar-12	shut in	shut in	shut in	
4-Mar-12	shut in	shut in	shut in	
5-Mar-12	shut in	shut in	shut in	
6-Mar-12	1025	229	211	
7-Mar-12	1040	215	208	
8-Mar-12	1052	208	205	
9-Mar-12	1086	208	195	
10-Mar-12	1110	215	215	
11-Mar-12	1099	264	289	
12-Mar-12	1099	340	336	
13-Mar-12	1150	354	363	
14-Mar-12	1129	347	355	
15-Mar-12	1133	347	357	
16-Mar-12	1131	340	355	
17-Mar-12	1143	340	356	
18-Mar-12	1153	340	354	
19-Mar-12	1145	354	347	
20-Mar-12	1102	313	303	
21-Mar-12	1112	326	324	
22-Mar-12	940	313	308	
23-Mar-12	1148	313	328	
24-Mar-12	1153	313	320	
25-Mar-12	1142	146	146	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	0	0	75	
29-Mar-12	0	0	135	
30-Mar-12	shut in	shut in	shut in	
31-Mar-12	shut in	shut in	shut in	

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Mar-12 Monthly Averages

Injection Pressure 1004 Injection Flow 265 Return Flow 277

Maximum Injection Pressure and corresponding Injection Flow

Date 18-Mar-12 Injection Pressure

Injection Flow 340

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure

Injection Flow

28-Mar-12

0

0

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

13-Mar-12

Injection Flow

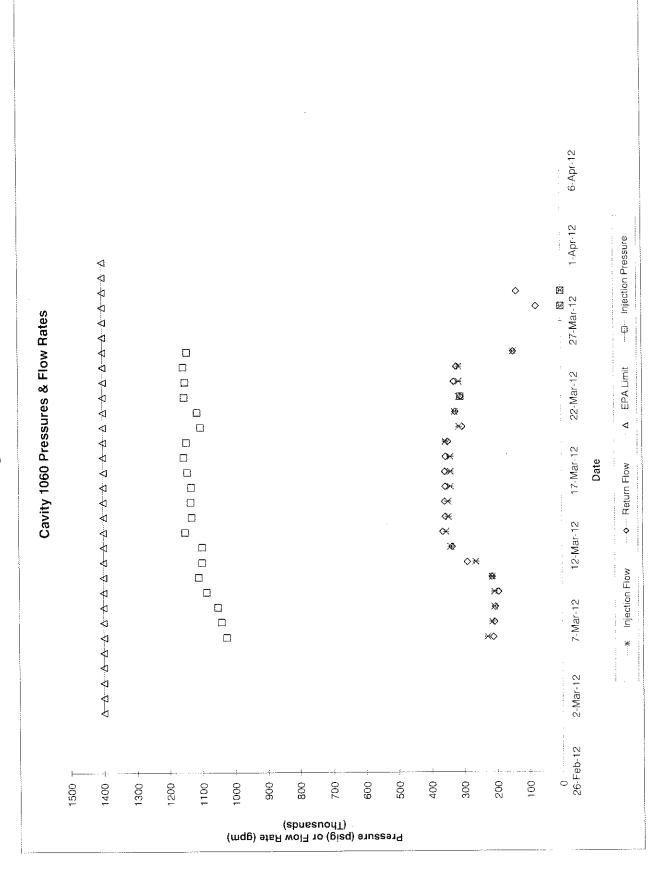
354

Injection Pressure

1150



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#### Cavity 2030 🔑

#### Daily Averages

Date	Date Injection In Pressure (psi)		Return Flow (gpm)
1-Mar-12	1178	283	283
2-Mar-12	1203	280	280
3-Mar-12	1200	316	316
4-Mar-12	1193	266	266
5-Mar-12	1187	277	277
6-Mar-12	1173	304	304
7-Mar-12	1210	301	301
8-Mar-12	1207	293	293
9-Mar-12	1200	267	267
10-Mar-12	1173	281	281
11-Mar-12	1187	281	281
12-Mar-12	1180	295	295
13-Mar-12	1176	325	325
14-Mar-12	1215	268	268
15-Mar-12	1188	295	295
16-Mar-12	1175	272	272
17-Mar-12	1210	280	280
18-Mar-12	1200	286	286
19-Mar-12	1168	286	286
20-Mar-12	1200	318	318
21-Mar-12	1200	340	340
22-Mar-12	1213	208	208
23-Mar-12	1200	312	312
24-Mar-12	1175	361	361
25-Mar-12	1180	181	181
26-Mar-12	shut in	shut in	shut in
27-Mar-12	shut in	shut in	shut in
28-Mar-12	1300	46	46
29-Mar-12	1200	81	81
30-Mar-12	1230	327	327
31-Mar-12	1204	231	231

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Mar-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1197

271

271

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

28-Mar-12

1300

46

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

19-Mar-12

1168

286

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

24-Mar-12

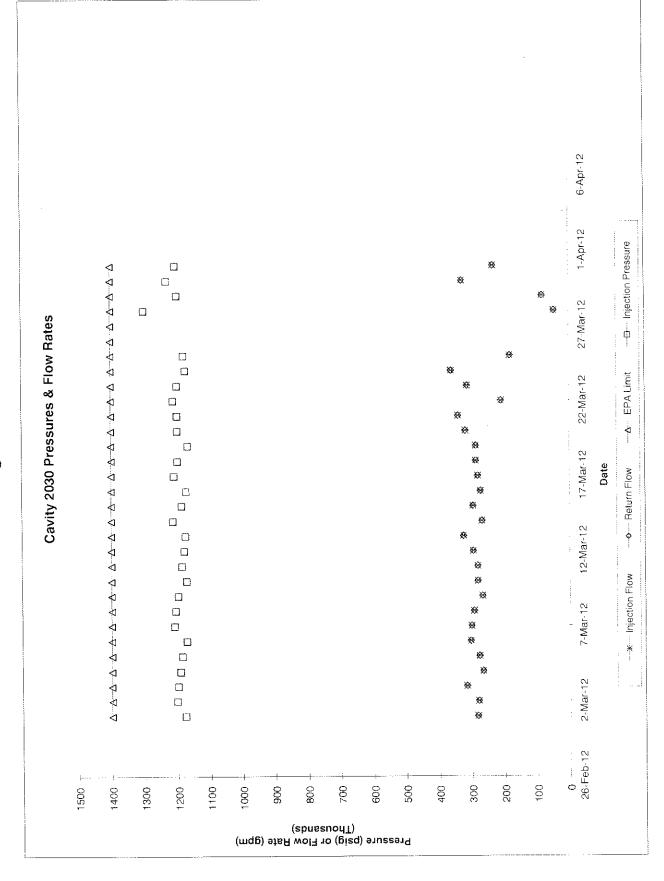
Injection Flow (gpm) 361 Injection Pressure (psi)

1175

1



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#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)	
1-Mar-12	shut in	shut in	shut in	
2-Mar-12	shut in	shut in	shut in	
3-Mar-12	shut in	shut in	shut in	
4-Mar-12	shut in	shut in	shut in	
5-Mar-12	shut in	shut in	shut in	
6-Mar-12	shut in	shut in	shut in	
7-Mar-12	shut in	shut in	shut in	
8-Mar-12	shut in	shut in	shut in	
9-Mar-12	shut in	shut in	shut in	
10-Mar-12	shut in	shut in	shut in	
11-Mar-12	shut in	shut in	shut in	
12-Mar-12	shut in	shut in	shut in	
13-Mar-12	shut in	shut in	shut in	
14-Mar-12	shut in	shut in	shut in	
15-Mar-12	shut in	shut in	shut in	
16-Mar-12	shut in	shut in	shut in	
17-Mar-12	shut in	shut in	shut in	
18-Mar-12	shut in	shut in	shut in	
19-Mar-12	shut in	shut in	shut in	
20-Mar-12	shut in	shut in	shut in	
21-Mar-12	shut in	shut in	shut in	
22-Mar-12	shut in	shut in	shut in	
23-Mar-12	shut in	shut in	shut in	
24-Mar-12	shut in	shut in	shut in	
25-Mar-12	shut in	shut in	shut in	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	shut in	shut in	shut in	
29-Mar-12	shut in	shut in	shut in	
30-Mar-12	shut in	shut in	shut in	
31-Mar-12	shut in	shut in	shut in	



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#### Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
/	(psi)	(gpm)	(gpm)	
1-Mar-12	1178	153	153	
2-Mar-12	1203	135	135	
3-Mar-12	1200	1.35	135	
4-Mar-12	1193	111	111	
5-Mar-12	1187	94	94	
6-Mar-12	1173	94	94	
7-Mar-12	1210	100	100	
8-Mar-12	1207	108	108	
9-Mar-12	1200	101	101	
10-Mar-12	1173	1.26	126	
11-Mar-12	1187	135	135	
12-Mar-12	1180	132	132	
13-Mar-12	1176	130	130	
14-Mar-12	1215	131	131	
15-Mar-12	1188	115	115	
16-Mar-12	1175	117	117	
17-Mar-12	1210	110	110	
18-Mar-12	1200	107	107	
19-Mar-12	1168	119	119	
20-Mar-12	1200	130	130	
21-Mar-12	1200	107	107	
22-Mar-12	1213	96	96	
23-Mar-12	1200	90	90	
24-Mar-12	1175	97	97	
25-Mar-12	1180	71	71	
26-Mar-12	shut in	shut in	shut in	
27-Mar-12	shut in	shut in	shut in	
28-Mar-12	shut in	shut in	shut in	
29-Mar-12	0	7	7	
30-Mar-12	1230	159	159	
31-Mar-12	1204	135	135	
	-			



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Mar-12 Monthly Averages

Injection Pressure (psi)

1151

Injection Flow (gpm)

112

Return Flow (gpm)

112

Maximum Injection Pressure and corresponding Injection Flow

Date

30-Mar-12

Injection Pressure (psi)

1230

Injection Flow (gpm)

159

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

7

29-Mar-12

0

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

30-Mar-12

Injection Flow (psi)

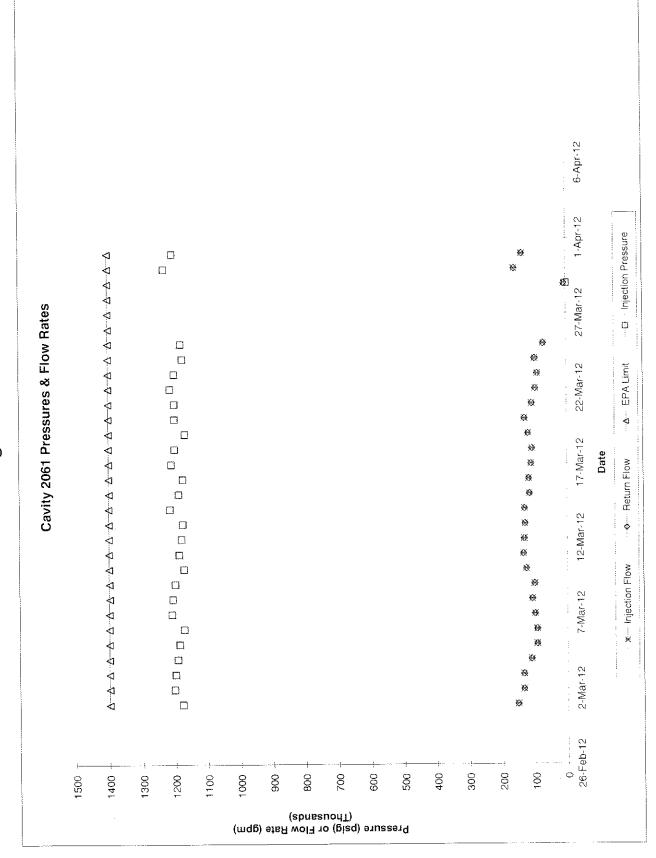
159

Injection Pressure (psi)

1230

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#### Daily Averages

	-		
	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Mar-12	shut in	shut in	shut in
2-Mar-12	shut in	shut in	shut in
3-Mar-12	shut in	shut in	shut in
4-Mar-12	shut in	shut in	shut in
5-Mar-12	shut in	shut in	shut in
6-Mar-12	shut in	shut in	shut in
7-Mar-12	shut in	shut in	shut in
8-Mar-12	shut in	shut in	shut in
9-Mar-12	shut in	shut in	shut in
10-Mar-12	shut in	shut in	shut in
11-Mar-12	shut in	shut in	shut in
12-Mar-12	shut in	shut in	shut in
13-Mar-12	shut in	shut in	shut in
14-Mar-12	shut in	shut in	shut in
15-Mar-12	shut in	shut in	shut in
16-Mar-12	shut in	shut in	shut in
17-Mar-12	shut in	shut in	shut in
18-Mar-12	shut in	shut in	shut in
19-Mar-12	shut in	shut in	shut in
20-Mar-12	shut in	shut in	shut in
21-Mar-12	shut in	shut in	shut in
22-Mar-12	shut in	shut in	shut in
23-Mar-12	shut in	shut in	shut in
24-Mar-12	shut in	shut in	shut in
25-Mar-12	shut in	shut in	shut in
26-Mar-12	shut in	shut in	shut in
27-Mar-12	shut in	shut in	shut in
28-Mar-12	shut in	shut in	shut in
29-Mar-12	shut in	shut in	shut in
30-Mar-12	shut in	shut in	shut in
31-Mar-12	shut in	shut in	shut in

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April 12, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604 UIC BRANCH EPA. REGION 5

Attn:

Lisa Perenchio

SUBJ: First Quarter Report – Solution Mining Wells

For the period of January 1, 2012 - March 31, 2012

Permit No.: MI-133-3G-A002

- 1. Solution Mining operations from Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061, Cavity 2062 were conducted during the quarter.
- 2. Well re-work reports for all well workovers during the period were submitted under separate cover by Doug Patulski, Minefield Superintendent.
- 3. The flowrates to and from the solution mining wells are monitored continuously. The required quarterly well injection/return balance demonstrations for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062 are attached.
- 4. The fluid level in the injection zone is "at surface".
- 5. Attached are copies of the well fluid chemical analyses for Cavity 1010, Cavity 1020, Cavity 1040, Cavity 1050, Cavity 1060, Cavity 2030, Cavity 2040, Cavity 2061 and Cavity 2062.
- 6. Attached are the chemical analyses of the fluid samples obtained from the ground water monitoring wells.

The requirements of Part I (E)(10), Part II (B)(2) and Part III (C)(3) of Permit No. MI-133-3G-A002 are being met. The samples and measurements are representative of the monitoring activity and the analysis complies with the methods and procedures approved in the Waste Analysis Plan.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please contact me at (231) 832-8800 if you have any questions.

Sincerely

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments

### Quarterly Injection/Return Flow Balances Cavity 1010

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
					-
1-Jan-12	shut in	shut in	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in	shut in	shut in
8-J <b>a</b> n-12	shut in	shut in	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in	shut in	shut in
1-Feb-12	shut in	shut in	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in	shut in	shut in

		Gavity	, 1010		
15-Feb-12	shut in				
16-Feb-12	shut in				
17-Feb-12	shut in				
18-Feb-12	shut in				
19-Feb-12	shut in				
20-Feb-12	shut in				
21-Feb-12	shut in				
22-Feb-12	shut in				
23-Feb-12	shut in				
24-Feb-12	shut in				
25-Feb-12	shut in				
26-Feb-12	shut in				
27-Feb-12	shut in				
28-Feb-12	shut in				
29-Feb-12	shut in				
1-Mar-12	shut in				
2-Mar-12	shut in				
3-Mar-12	shut in				
4-Mar-12	shut in				
5-Mar-12	shut in				
6-Mar-12	shut in				
7-Mar-12	shut in				
8-Mar-12	shut in				
9-Mar-12	shut in				
10-Mar-12	shut in				
11-Mar-12	shut in				
12-Mar-12	shut in				
13-Mar-12	shut in				
14-Mar-12	shut in				
15-Mar-12	shut in				
16-Mar-12	shut in				
17-Mar-12	shut in				
18-Mar-12	shut in				
19-Mar-12	shut in				
20-Mar-12	shut in				
21-Mar-12	shut in				
22-Mar-12	shut in				
23-Mar-12	shut in				
24-Mar-12	shut in				
25-Mar-12	shut in				
26-Mar-12	shut in				
27-Mar-12	shut in				
28-Mar-12	shut in				
29-Mar-12	shut in				
30-Mar-12	shut in				
31-Mar-12	shut in				

shut in shut in

Averages

shut in

shut in

shut in

	Total						
	Injection	Dilution	Injection	Return	Ratio		
Date	Flow	Flow	Flow	Flow	Inj/Ret		
Date				*			
1-Jan-12	shut in	shut in	shut in	shut in	shut in		
2-Jan-12	shut in	shut in	shut in	shut in	shut in		
3-Jan-12	shut in	shut in	shut in	shut in	shut in		
4-Jan-12	shut in	shut in	shut in	shut in	shut in		
5-Jan-12	shut in	shut in	shut in	shut in	shut in		
6-Jan-12	shut in	shut in	shut in	shut in	shut in		
7-Jan-12	shut in	shut in	shut in	shut in	shut in		
8-Jan-12	shut in	shut in	shut in	shut in	shut in		
9-Jan-12	shut in	shut in	shut in	shut in	shut in		
10-Jan-12	shut in	shut in	shut in	shut in	shut in		
11-Jan-12	shut in	shut in	shut in	shut in	shut in		
12-Jan-12	shut in	shut in	shut in	shut in	shut in		
13-Jan-12	shut in	shut in	shut in	shut in	shut in		
14-Jan-12	shut in	shut in	shut in	shut in	shut in		
15-Jan-12	shut in	shut in	shut in	shut in	shut in		
16-Jan-12	shut in	shut in	shut in	shut in	shut in		
17-Jan-12	shut in	shut in	shut in	shut in	shut in		
18-Jan-12	shut in	shut in	shut in	shut in	shut in		
19-Jan-12	shut in	shut in	shut in	shut in	shut in		
20-Jan-12	339	0.0	339	336	1.01		
21-Jan-12	320	0.0	320	319	1.00		
22-Jan-12	317	0.0	317	299	1.06		
23-Jan-12	289	0.0	289	284	1.02		
24-Jan-12	80	0.0	80	144	0.56		
25-Jan-12	shut in	shut in	shut in	shut in	shut in		
26-Jan-12	shut in	shut in	shut in	shut in	shut in		
27-Jan-12	shut in	shut in	shut in	shut in	shut in		
28-Jan-12	shut in	shut in	shut in	shut in	shut in		
29-Jan-12	shut in	shut in	shut in	shut in	shut in		
30-Jan-12	233	0.0	233	261	0.89		
31-Jan-12	243	0.0	243	257	0.95		
1-Feb-12	243	8.4	251	251	1.00		
2-Feb-12	262	5.7	268	270	0.99		
3-Feb-12	270	5.9	276	271	1.02		
4-Feb-12	273	0.0	273	262	1.04		
5-Feb-12	233	5.1	238	247	0.96		
6-Feb-12	271	6.1	277	274	1.01		
7-Feb-12	268	6.1	274	268	1.02		
8-Feb-12	294	0.0	294	301	0.98		
9-Feb-12	271	0.0	271	260	1.04		
10-Feb-12	202	4.4	206	195	1.06		
11-Feb-12	252	4.0	256	253	1.01		
12-Feb-12	250	0.0	250	264	0.95		
13-Feb-12	257	0.0	257	261	0.98		
14-Feb-12	292	0.0	292	292	1.00		

15-Feb-12	281	4.7	286	287	1.00
16-Feb-12	303	0.9	304	307	0.99
17-Feb-12	298	0.0	298	298	1.00
18-Feb-12	290	4.6	295	294	1.00
19-Feb-12	300	0.0	300	303	0.99
20-Feb-12	323	6.4	329	327	1.01
21-Feb-12	319	0.0	319	317	1.01
22-Feb-12	326	0.0	326	324	1.01
23-Feb-12	306	0.0	306	308	0.99
24-Feb-12	313	2.8	316	315	1.00
25-Feb-12	333	6.1	339	333	1.02
26-Feb-12	319	5.8	325	317	1.02
27-Feb-12	354	7.0	361	367	0.98
28-Feb-12	367	7.5	375	362	1.03
29-Feb-12	372	5.2	377	368	1.03
1-Mar-12	374	4.8	379	361	1.05
2-Mar-12	386	0.0	386	381	1.01
3-Mar-12	382	0.0	382	375	1.02
4-Mar-12	351	0.0	351	356	0.99
5-Mar-12	327	5.6	333	295	1.13
6-Mar-12	191	5.1	196	201	0.98
7-Mar-12	204	0.0	204	202	1.01
8-Mar-12	196	6.1	202	202	1.00
9-Mar-12	181	5.4	186	176	1.06
10-Mar-12	167	4.2	171	160	1.07
11-Mar-12	shut in				
12-Mar-12	shut in				
13-Mar-12	shut in				
14-Mar-12	shut in				
15-Mar-12	shut in				
16-Mar-12	shut in				
17-Mar-12	shut in				
18-Mar-12	shut in				
19-Mar-12	shut in				
20-Mar-12	shut in				
21-Mar-12	shut in				
22-Mar-12	shut in				
23-Mar-12	shut in				
24-Mar-12	shut in				
25-Mar-12	shut in				
26-Mar-12	shut in				
27-Mar-12	shut in				
28-Mar-12	shut in				
29-Mar-12	shut in				
30-Mar-12	shut in				
31-Mar-12	215	0.0	215	224	0.96
	_		000	005	1.00
Averages	283	2.8	286	285	1.00

	Injection	Dilution	Total Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
37.			a la colo ina	abut in	shut in
1-Jan-12	shut in	shut in	shut in	shut in shut in	shut in
2-Jan-12	shut in	shut in	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in		shut in
5-Jan-12	shut in	shut in	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in	shut in	
13-Jan-12	shut in	shut in	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in	shut in	shut in
1-Feb-12	shut in	shut in	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in	shut in	shut in

16 5 1 10	a facilità diss	abut in	shut in	shut in	shut in
15-Feb-12	shut in	shut in shut in	shut in	shut in	shut in
16-Feb-12	shut in	shut in	shut in	shut in	shut in
17-Feb-12	shut in	shut in	shut in	shut in	shut in
18-Feb-12	shut in		shut in	shut in	shut in
19-Feb-12	shut in	shut in	shut in	shut in	shut in
20-Feb-12	shut in	shut in	shut in	shut in	shut in
21-Feb-12	shut in	shut in	shut in	shut in	shut in
22-Feb-12	shut in	shut in	shut in	shut in	shut in
23-Feb-12	shut in	shut in	shut in	shut in	shut in
24-Feb-12	shut in	shut in	shut in	shut in	shut in
25-Feb-12	shut in	shut in	shut in	shut in	shut in
26-Feb-12	shut in	shut in		shut in	shut in
27-Feb-12	shut in	shut in	shut in	shut in	shut in
28-Feb-12	shut in	shut in	shut in	shut in	shut in
29-Feb-12	shut in	shut in	shut in	shut in	shut in
1-Mar-12	shut in	shut in	shut in	shut in	shut in
2-Mar-12	shut in	shut in	shut in	shut in	shut in
3-Mar-12	shut in	shut in	shut in	shut in	shut in
4-Mar-12	shut in	shut in	shut in	shut in	shut in
5-Mar-12	shut in	shut in	shut in	shut in	shut in
6-Mar-12	shut in	shut in	shut in		shut in
7-Mar-12	shut in	shut in	shut in	shut in	shut in
8-Mar-12	shut in	shut in	shut in	shut in	shut in
9-Mar-12	shut in	shut in	shut in	shut in	shut in
10-Mar-12	shut in	shut in	shut in	shut in	shut in
11-Mar-12	shut in	shut in	shut in	shut in	shut in
12-Mar-12	shut in	shut in	shut in	shut in	shut in
13-Mar-12	shut in	shut in	shut in	shut in	shut in
14-Mar-12	shut in	shut in	shut in	shut in	
15-Mar-12	shut in	shut in	shut in	shut in	shut in
16-Mar-12	shut in	shut in	shut in	shut in	shut in
17-Mar-12	shut in	shut in	shut in	shut in	shut in
18-Mar-12	shut in	shut in	shut in	shut in	shut in
19-Mar-12	shut in	shut in	shut in	shut in	shut in
20-Mar-12	shut in	shut in	shut in	shut in	shut in
21-Mar-12	shut in	shut in	shut in	shut in	shut in
22-Mar-12	shut in	shut in	shut in	shut in	shut in
23-Mar-12	shut in	shut in	shut in	shut in	shut in
24-Mar-12	shut in	shut in	shut in	shut in	shut in
25-Mar-12	shut in	shut in	shut in	shut in	shut in
26-Mar-12	shut in	shut in	shut in	shut in	shut in
27-Mar-12	shut in	shut in	shut in	shut in	shut in
28-Mar-12	shut in	shut in	shut in	shut in	shut in
29-Mar-12	shut in	shut in	shut in	shut in	shut in
30-Mar-12	shut in	shut in	shut in	shut in	shut in
31-Mar-12	shut in	shut in	shut in	shut in	shut in
Averages	shut in	shut in	shut in	shut in	shut in

Date   Date   Flow		Total _						
1. Jan-12								
2 Jan-12   188   5.3   193   188   1.03     3 Jan-12   189   5.7   195   199   1.03     4 Jan-12   200   3.6   204   200   1.02     5 Jan-12   184   4.4   188   184   1.02     6 Jan-12   185   4.7   170   165   1.03     7 Jan-12   153   4.8   158   153   1.03     8 Jan-12   193   4.8   198   193   1.02     9 Jan-12   183   4.8   188   183   1.03     10 Jan-12   164   5.0   169   164   1.03     11 Jan-12   150   4.7   155   150   1.03     12 Jan-12   199   0.0   199   199   1.00     13 Jan-12   180   2.8   183   180   1.02     4 Jan-12   179   4.7   184   179   1.03     15 Jan-12   178   0.0   178   178   1.00     7 Jan-12   178   0.0   178   178   1.00     7 Jan-12   180   0.1   180   184   185   150     1.03   19 Jan-12   180   0.1   180   184   184     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.0   193   193   1.00     17 Jan-12   179   4.7   184   179   1.03     15 Jan-12   180   0.0   180   180   180     10 Jan-12   190   0.0   197   197   1.00     24 Jan-12   191   0.0   197   197   1.00     25 Jan-12   197   0.0   197   197   1.00     26 Jan-12   197   0.0   197   197   1.00     27 Jan-12   180   0.0   190   190   1.00     28 Jan-12   197   0.0   197   197   1.00     28 Jan-12   197   0.0   190   190   1.00     31 Jan-12   180   0.0   180   180   185   1.03     31 Jan-12   180   0.0   190   190   1.00     32 Jan-12   190   0.0   190   190   1.00     4 Feb-12   158   4.8   163   158   1.03     5 Feb-12   166   4.5   171   166   1.03     5 Feb-12   170   4.6   175   170   1.03     5 Feb-12   166   4.5   177   1.00     19 Feb-12   176   0.0   176   175   1.00     10 Feb-12   116   4.0   120   116   103     11 Feb-12   176   0.0   176   1	Date	Flow	Flow	Flow	Flow	Inj/Ret		
2 Jan-12   188   5.3   193   188   1.03     3 Jan-12   189   5.7   195   199   1.03     4 Jan-12   200   3.6   204   200   1.02     5 Jan-12   184   4.4   188   184   1.02     6 Jan-12   185   4.7   170   165   1.03     7 Jan-12   153   4.8   158   153   1.03     8 Jan-12   193   4.8   198   193   1.02     9 Jan-12   183   4.8   188   183   1.03     10 Jan-12   164   5.0   169   164   1.03     11 Jan-12   150   4.7   155   150   1.03     12 Jan-12   199   0.0   199   199   1.00     13 Jan-12   180   2.8   183   180   1.02     4 Jan-12   179   4.7   184   179   1.03     15 Jan-12   178   0.0   178   178   1.00     7 Jan-12   178   0.0   178   178   1.00     7 Jan-12   180   0.1   180   184   185   150     1.03   19 Jan-12   180   0.1   180   184   184     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.1   180   180   1.03     15 Jan-12   180   0.0   193   193   1.00     17 Jan-12   179   4.7   184   179   1.03     15 Jan-12   180   0.0   180   180   180     10 Jan-12   190   0.0   197   197   1.00     24 Jan-12   191   0.0   197   197   1.00     25 Jan-12   197   0.0   197   197   1.00     26 Jan-12   197   0.0   197   197   1.00     27 Jan-12   180   0.0   190   190   1.00     28 Jan-12   197   0.0   197   197   1.00     28 Jan-12   197   0.0   190   190   1.00     31 Jan-12   180   0.0   180   180   185   1.03     31 Jan-12   180   0.0   190   190   1.00     32 Jan-12   190   0.0   190   190   1.00     4 Feb-12   158   4.8   163   158   1.03     5 Feb-12   166   4.5   171   166   1.03     5 Feb-12   170   4.6   175   170   1.03     5 Feb-12   166   4.5   177   1.00     19 Feb-12   176   0.0   176   175   1.00     10 Feb-12   116   4.0   120   116   103     11 Feb-12   176   0.0   176   1	1 ion 10	164	4.0	160	164	1.02		
3-Jan-12   189   5.7   195   189   1.03								
4-Jan-12         200         3.6         204         200         1.02           5-Jan-12         184         4.4         188         184         1.02           6-Jan-12         165         4.7         170         165         1.03           7-Jan 12         153         4.8         156         153         1.03           8-Jan-12         193         4.8         198         193         1.02           9-Jan-12         183         4.8         188         183         1.03           10-Jan-12         164         5.0         169         164         1.03           11-Jan-12         150         4.7         155         150         1.03           12-Jan-12         199         0.0         199         199         1.00           13-Jan-12         190         0.0         199         199         1.00           14-Jan-12         179         4.7         184         179         1.03           15-Jan-12         190         0.0         193         193         1.00           14-Jan-12         179         4.7         184         179         1.03           15-Jan-12         179         4.7 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
5-Jan-12								
6-Jan-12 165 4.7 170 165 103 7-Jan-12 153 4.8 158 153 1.03 8-Jan-12 193 4.8 198 193 1.02 9-Jan-12 183 4.8 188 188 183 1.03 10-Jan-12 164 5.0 169 164 1.03 11-Jan-12 150 4.7 155 150 1.03 11-Jan-12 199 0.0 199 199 100 12-Jan-12 190 2.8 183 180 1.02 14-Jan-12 179 4.7 184 179 1.03 15-Jan-12 150 4.8 155 150 1.03 16-Jan-12 179 4.7 184 179 1.03 16-Jan-12 193 0.0 193 193 1.00 17-Jan-12 178 0.0 178 178 1.00 17-Jan-12 178 0.0 178 178 1.00 17-Jan-12 179 0.0 194 194 100 17-Jan-12 179 0.0 194 194 100 12-Jan-12 195 0.0 188 188 1.00 22-Jan-12 194 0.0 194 194 1.00 21-Jan-12 188 0.0 183 183 1.00 22-Jan-12 197 0.0 197 197 1.00 22-Jan-12 197 0.0 197 197 1.00 24-Jan-12 197 0.0 197 197 1.00 25-Jan-12 197 0.0 197 197 1.00 26-Jan-12 197 0.0 197 197 1.00 27-Jan-12 179 3.8 183 183 179 1.02 29-Jan-12 179 3.8 183 193 189 1.02 29-Jan-12 179 3.8 183 193 189 1.02 29-Jan-12 179 3.8 183 179 1.00 27-Jan-12 189 3.8 183 179 1.00 27-Jan-12 179 3.8 183 179 1.00 28-Jan-12 171 3.9 176 171 1.00 29-Jan-12 179 3.8 183 179 1.00 29-Jan-12 179 3.8 183 193 189 1.00 29-Jan-12 179 3.8 183 193 189 1.02 30-Jan-12 170 4.6 175 177 1.00 30-Jan-12 152 0.0 162 162 1.00 3-Feb-12 166 4.5 171 1.00 3-Feb-12 170 4.6 175 177 1.00 3-Feb-12 170 4.6 176 177 177 1.00 3-Feb-12 176 0.0 177 177 1.00 3-Feb-12 176 0.0 177 177 1.00 3-Feb-12 176 0.0 176 176 176 1.00								
7-Jan 12								
8-Jan-12 193 4.8 198 193 1.02 9-Jan-12 183 4.8 188 183 1.03 10-Jan-12 164 5.0 169 164 1.03 11-Jan-12 150 4.7 155 150 1.03 12-Jan-12 199 0.0 199 199 1.00 12-Jan-12 199 0.0 199 199 1.00 13-Jan-12 179 4.7 184 179 1.03 15-Jan-12 150 4.8 155 150 1.03 15-Jan-12 178 0.0 178 178 1.00 17-Jan-12 178 0.0 178 178 1.00 17-Jan-12 179 0.0 194 194 1.00 17-Jan-12 194 0.0 194 194 1.00 17-Jan-12 194 0.0 194 194 1.00 12-Jan-12 198 0.0 188 188 188 1.00 12-Jan-12 197 0.0 197 197 197 1.00 12-Jan-12 188 0.0 188 189 1.00 12-Jan-12 197 0.0 197 197 197 1.00 12-Jan-12 197 0.0 197 197 1.00 12-Jan-12 199 3.8 183 179 1.00 12-Jan-12 199 3.8 183 179 1.00 13-Jan-12 152 0.0 152 152 1.00 13-Jan-12 158 4.8 163 158 1.03 1-Feb-12 158 4.8 163 158 1.03 1-Feb-12 166 4.5 171 186 1.03 1-Feb-12 165 4.4 169 165 1.03 1-Feb-12 165 1.00 1-Feb-12 177 0.0 185 185 185 1.00 1-Feb-12 177 0.0 185 185 185 1.00 1-Feb-12 177 0.0 177 177 170 1.00 1-Feb-12 177 0.0 177 177 1.00 1-Feb-12 189 0.0 185 185 1.00 1-Feb-12 177 0.0 185 185 185 1.00 1-Feb-12 166 4.5 171 186 1.03 1-Feb-12 167 0.0 177 177 177 1.00 1-Feb-12 179 4.7 184 179 1.03 1-Feb-12 166 1.03 1-Feb-12 177 0.0 177 177 177 1.00 1-Feb-12 176 0.0 176 176 176 1.00								
9-Jan-12 188 4.8 188 183 1.03 10-Jan-12 164 5.0 169 164 1.03 11-Jan-12 150 4.7 155 150 1.03 12-Jan-12 199 0.0 199 199 1.00 13-Jan-12 180 2.8 183 180 1.02 14-Jan-12 179 4.7 184 179 1.03 15-Jan-12 150 4.8 155 150 1.03 16-Jan-12 193 0.0 193 193 193 1.00 17-Jan-12 193 0.0 193 193 193 1.00 18-Jan-12 193 0.0 193 193 193 1.00 18-Jan-12 198 0.0 178 178 1.00 18-Jan-12 180 0.0 194 194 1.00 18-Jan-12 180 0.0 194 194 1.00 18-Jan-12 180 0.0 194 194 1.00 21-Jan-12 188 0.0 188 188 188 1.00 22-Jan-12 188 0.0 188 188 188 1.00 22-Jan-12 188 0.0 188 188 188 1.00 23-Jan-12 197 0.0 197 197 1.00 24-Jan-12 197 0.0 197 197 1.00 24-Jan-12 197 0.0 197 197 1.00 25-Jan-12 197 0.0 197 197 1.00 26-Jan-12 197 0.0 197 197 1.00 27-Jan-12 179 3.8 183 179 1.00 27-Jan-12 189 3.8 193 189 1.02 28-Jan-12 197 0.0 197 197 1.00 27-Jan-12 189 3.8 193 189 1.02 28-Jan-12 179 3.8 183 183 1.00 27-Jan-12 189 3.8 193 189 1.02 28-Jan-12 179 3.8 163 183 179 1.00 27-Jan-12 189 3.8 193 189 1.02 30-Jan-12 150 0.0 150 152 152 1.00 31-Jan-12 152 0.0 152 152 1.00 31-Jan-12 155 0.0 162 162 1.00 31-Feb-12 166 4.5 171 166 1.03 4-Feb-12 165 4.4 169 165 1.03 4-Feb-12 165 4.4 169 165 1.03 4-Feb-12 165 4.4 169 165 1.03 4-Feb-12 166 4.5 171 166 1.03 4-Feb-12 170 4.6 175 170 1.03 8-Feb-12 170 1.00 175 177 177 1.00 10-Feb-12 176 0.0 176 176 1.00 11-Feb-12 176 0.0 176 176 1.00 11-Feb-12 176 0.0 176 176 1.00								
10 Jan 12 164 5.0 169 164 1.03 11 Jan 12 150 4.7 155 150 1.03 11 Jan 12 150 0.0 199 199 190 1.00 13 Jan 12 180 2.8 183 180 1.02 14 Jan 12 179 4.7 184 179 1.03 15 Jan 12 150 4.8 155 150 1.03 16 Jan 12 193 0.0 193 193 193 1.00 17 Jan 12 178 0.0 178 178 1.00 17 Jan 12 178 0.0 178 178 1.00 17 Jan 12 178 0.0 193 193 193 1.00 17 Jan 12 178 0.0 198 178 1.00 17 Jan 12 180 0.0 188 178 1.00 18 Jan 12 67 0.9 68 67 1.01 19 Jan 12 194 0.0 194 194 1.00 20 Jan 12 194 0.0 188 188 180 1.00 22 Jan 12 194 0.0 188 188 180 1.00 22 Jan 12 183 0.0 183 183 180 1.00 22 Jan 12 183 0.0 183 183 1.00 22 Jan 12 197 0.0 197 197 1.00 24 Jan 12 197 0.0 197 197 1.00 24 Jan 12 197 0.0 197 197 1.00 25 Jan 12 197 0.0 197 197 1.00 26 Jan 12 197 0.0 197 197 1.00 27 Jan 12 179 3.8 183 179 1.02 28 Jan 12 197 0.0 197 197 1.00 27 Jan 12 179 3.8 183 183 179 1.02 28 Jan 12 197 0.0 197 197 1.00 27 Jan 12 179 3.8 183 183 179 1.02 28 Jan 12 190 0.0 190 190 190 1.00 31 Jan 12 152 0.0 152 152 1.00 31 Jan 12 152 0.0 162 163 158 1.03 2 Feb 12 166 4.5 171 166 1.03 3 Feb 12 166 4.5 171 166 1.03 4 Feb 12 166 4.5 171 166 1.03 4 Feb 12 166 4.5 171 166 1.03 4 Feb 12 162 1.00 1.07 5 Feb 12 166 4.5 171 166 1.03 5 Feb 12 177 0.0 177 177 1.00 5 Feb 12 179 4.7 184 179 1.03								
11-Jan-12								
12-Jan-12 199 0.0 199 199 199 1.00 13-Jan-12 180 2.8 183 180 1.02 14-Jan-12 179 4.7 184 179 1.03 15-Jan-12 150 4.8 155 150 1.03 16-Jan-12 193 0.0 193 193 1.00 17-Jan-12 178 0.0 178 178 1.00 17-Jan-12 178 0.0 178 178 1.00 17-Jan-12 178 0.0 193 193 1.00 17-Jan-12 178 0.0 178 178 1.00 18-Jan-12 67 0.9 68 67 1.01 19-Jan-12 194 0.0 194 194 1.00 21-Jan-12 188 0.0 188 188 1.00 22-Jan-12 188 0.0 188 188 1.00 22-Jan-12 183 0.0 188 183 1.00 22-Jan-12 197 0.0 197 197 1.00 23-Jan-12 197 0.0 197 197 1.00 24-Jan-12 197 0.0 197 197 1.00 26-Jan-12 190 0.0 197 197 1.00 27-Jan-12 190 0.0 197 197 1.00 28-Jan-12 171 3.9 175 171 1.02 29-Jan-12 189 3.8 183 179 1.02 29-Jan-12 189 3.8 193 189 1.02 30-Jan-12 189 3.8 193 189 1.02 30-Jan-12 189 3.8 193 189 1.02 30-Jan-12 166 4.4 169 150 1.00 31-Jan-12 152 0.0 152 152 1.00 31-Jan-12 166 4.4 169 165 1.03 3-Feb-12 166 4.5 171 166 1.03 4-Feb-12 166 4.5 171 166 1.03 4-Feb-12 166 4.5 171 166 1.03 4-Feb-12 169 0.0 160 177 177 170 1.03 8-Feb-12 166 4.5 171 184 179 1.03 8-Feb-12 166 4.5 171 184 179 1.03 9-Feb-12 170 4.6 177 184 179 1.03 9-Feb-12 170 4.6 177 184 179 1.03 9-Feb-12 170 4.6 177 177 177 1.00 10-Feb-12 116 4.0 120 116 1.03 11-Feb-12 116 4.0 120 116 1.03 11-Feb-12 116 4.0 120 116 1.03 11-Feb-12 116 4.0 100 120 116 1.03 11-Feb-12 116 1.03								
13-Jan-12         180         2.8         183         180         1.02           14-Jan-12         179         4.7         184         179         1.03           15-Jan-12         150         4.8         155         150         1.03           16-Jan-12         193         0.0         193         193         1.00           17-Jan-12         178         0.0         178         178         1.00           18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         187         0.0         197         197         1.00           24-Jan-12         197         0.0         197         197         1.00           24-Jan-12         197         0.0         197         197         1.00           25-Jan-12         197         0.0         197         197         1.00           27-Jan-12         179<								
14-Jan-12         179         4.7         184         179         1.03           15-Jan-12         150         4.8         155         150         1.03           16-Jan-12         193         0.0         193         193         1.00           17-Jan-12         178         0.0         178         178         1.00           18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         183         0.0         183         183         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         141         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           27-Jan-12         197         0.0         197         197         1.00           27-Jan-12         199<								
15-Jan-12         150         4.8         155         150         1.03           16-Jan-12         193         0.0         193         193         1.00           17-Jan-12         178         0.0         178         178         1.00           18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         183         0.0         183         183         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         194         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           27-Jan-12         197         3.8         183         179         1.00           28-Jan-12         171         3.9								
16-Jan-12         193         0.0         193         193         1.00           17-Jan-12         178         0.0         178         178         1.00           18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         183         0.0         183         183         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         141         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           27-Jan-12         197         0.0         197         197         1.00           28-Jan-12         171         3.9         175         171         1.02           29-Jan-12         189<								
17-Jan-12         178         0.0         178         178         1.00           18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         197         0.0         197         197         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         141         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           28-Jan-12         179         3.8         183         179         1.02           28-Jan-12         171         3.9         175         171         1.02           29-Jan-12         189         3.8         183         189         1.02           30-Jan-12         190         0.0								
18-Jan-12         67         0.9         68         67         1.01           19-Jan-12         shut in         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         197         0.0         197         197         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         197         0.0         197         197         1.00           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           27-Jan-12         179         3.8         183         179         1.00           27-Jan-12         179         3.8         183         179         1.02           28-Jan-12         171         3.9         175         171         1.02           29-Jan-12         189         3.8         193         189         1.02           30-Jan-12         150<								
19-Jan-12         shut in         shut in         shut in         shut in           20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         183         0.0         183         183         1.00           23-Jan-12         197         0.0         197         197         1.00           24-Jan-12         141         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           27-Jan-12         179         3.8         183         179         1.02           28-Jan-12         179         3.8         183         179         1.02           28-Jan-12         171         3.9         175         171         1.02           29-Jan-12         189         3.8         193         189         1.02           30-Jan-12         190         0.0         190         190         190         1.00           31-Jan-12         152 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
20-Jan-12         194         0.0         194         194         1.00           21-Jan-12         188         0.0         188         188         1.00           22-Jan-12         183         0.0         183         183         1.00           23-Jan-12         197         0.0         197         197         100           24-Jan-12         141         5.0         146         141         1.04           25-Jan-12         197         0.0         197         197         1.00           26-Jan-12         197         0.0         197         197         1.00           27-Jan-12         179         3.8         183         179         1.00           27-Jan-12         179         3.8         183         179         1.02           28-Jan-12         171         3.9         175         171         1.02           29-Jan-12         189         3.8         183         189         1.02           30-Jan-12         190         0.0         190         190         190         1.00           31-Jan-12         152         0.0         152         152         1.00           1-Feb-12         1								
21-Jan-12								
22-Jan-12       183       0.0       183       183       1.00         23-Jan-12       197       0.0       197       197       1.00         24-Jan-12       141       5.0       146       141       1.04         25-Jan-12       197       0.0       197       197       1.00         26-Jan-12       197       0.0       197       197       1.00         27-Jan-12       179       3.8       183       179       1.02         28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       179       4.7       <								
23-Jan-12       197       0.0       197       197       1.00         24-Jan-12       141       5.0       146       141       1.04         25-Jan-12       197       0.0       197       197       1.00         26-Jan-12       197       0.0       197       197       1.00         27-Jan-12       179       3.8       183       179       1.02         28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       179       4.7       184       145       1.02         6-Feb-12       170       4.6 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td></t<>								
24-Jan-12       141       5.0       146       141       1.04         25-Jan-12       197       0.0       197       197       1.00         26-Jan-12       197       0.0       197       197       1.00         27-Jan-12       179       3.8       183       179       1.02         28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0 <td< td=""><td></td><td></td><td></td><td></td><td></td><td></td></td<>								
25-Jan-12 197 0.0 197 197 1.00 26-Jan-12 197 0.0 197 197 1.00 27-Jan-12 179 3.8 183 179 1.02 28-Jan-12 171 3.9 175 171 1.02 29-Jan-12 189 3.8 193 189 1.02 30-Jan-12 190 0.0 190 190 1.00 31-Jan-12 152 0.0 152 152 1.00 31-Jan-12 158 4.8 163 158 1.03 2-Feb-12 158 4.8 169 165 1.03 3-Feb-12 166 4.5 171 166 1.03 4-Feb-12 162 0.0 162 162 1.00 5-Feb-12 145 2.7 148 145 1.02 6-Feb-12 179 4.7 184 179 1.03 7-Feb-12 185 0.0 185 185 1.00 9-Feb-12 185 0.0 185 185 1.00 9-Feb-12 177 0.0 185 185 1.00 9-Feb-12 177 0.0 177 177 1.00 10-Feb-12 116 4.0 120 116 1.03 11-Feb-12 162 3.4 165 1.02 11-Feb-12 170 1.03 11-Feb-12 170 1.03 11-Feb-12 170 1.03 11-Feb-12 177 0.0 177 177 1.00 11-Feb-12 176 0.0 176 176 1.00 13-Feb-12 176 0.0 176 176 1.00 13-Feb-12 176 0.0 176 176 1.00								
26-Jan-12       197       0.0       197       197       1.00         27-Jan-12       179       3.8       183       179       1.02         28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0								
27-Jan-12       179       3.8       183       179       1.02         28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       1								
28-Jan-12       171       3.9       175       171       1.02         29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       1								
29-Jan-12       189       3.8       193       189       1.02         30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       1								
30-Jan-12       190       0.0       190       190       1.00         31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       1								
31-Jan-12       152       0.0       152       152       1.00         1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00								
1-Feb-12       158       4.8       163       158       1.03         2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00						1.00		
2-Feb-12       165       4.4       169       165       1.03         3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00						1.03		
3-Feb-12       166       4.5       171       166       1.03         4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00						1.03		
4-Feb-12       162       0.0       162       162       1.00         5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00					166	1.03		
5-Feb-12       145       2.7       148       145       1.02         6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00					162	1.00		
6-Feb-12       179       4.7       184       179       1.03         7-Feb-12       170       4.6       175       170       1.03         8-Feb-12       185       0.0       185       185       1.00         9-Feb-12       177       0.0       177       177       1.00         10-Feb-12       116       4.0       120       116       1.03         11-Feb-12       162       3.4       165       162       1.02         12-Feb-12       176       0.0       176       176       1.00         13-Feb-12       175       0.0       175       175       1.00				148	145	1.02		
7-Feb-12     170     4.6     175     170     1.03       8-Feb-12     185     0.0     185     185     1.00       9-Feb-12     177     0.0     177     177     1.00       10-Feb-12     116     4.0     120     116     1.03       11-Feb-12     162     3.4     165     162     1.02       12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00				184	179	1.03		
8-Feb-12     185     0.0     185     185     1.00       9-Feb-12     177     0.0     177     177     1.00       10-Feb-12     116     4.0     120     116     1.03       11-Feb-12     162     3.4     165     162     1.02       12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00			4.6	175	170	1.03		
9-Feb-12     177     0.0     177     177     1.00       10-Feb-12     116     4.0     120     116     1.03       11-Feb-12     162     3.4     165     162     1.02       12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00		•	0.0	185	185	1.00		
10-Feb-12     116     4.0     120     116     1.03       11-Feb-12     162     3.4     165     162     1.02       12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00			0.0	177	177	1.00		
11-Feb-12     162     3.4     165     162     1.02       12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00				120	116	1.03		
12-Feb-12     176     0.0     176     176     1.00       13-Feb-12     175     0.0     175     175     1.00			3.4	165	162	1.02		
13-Feb-12 175 0.0 175 175 1.00				176	176	1.00		
		175	0.0	175	175			
	14-Feb-12	180	0.0	180	180	1.00		

			-		
15-Feb-12	159	1.2	160	159	1.01
16-Feb-12	179	3.9	183	179	1.02
17-Feb-12	181	0.0	181	181	1.00
18-Feb-12	184	1.6	186	184	1.01
19-Feb-12	193	0.0	193	193	1.00
20-Feb-12	177	2.4	179	177	1.01
21-Feb-12	181	0.0	181	181	1.00
22-Feb-12	182	0.0	182	182	1.00
23-Feb-12	180	0.0	180	180	1.00
24-Feb-12	176	1.8	178	176	1.01
25-Feb-12	186	3.1	189	186	1.02
26-Feb-12	186	3.5	190	186	1.02
27-Feb-12	173	4.7	178	173	1.03
28-Feb-12	181	5.2	186	181	1.03
29-Feb-12	189	4.5	194	189	1.02
1-Mar-12	187	3.2	190	187	1.02
2-Mar-12	182	0.0	182	182	1.00
3-Mar-12	191	0.0	191	191	1.00
4-Mar-12	194	0.0	194	194	1.00
5-Mar-12	176	6.3	182	176	1.04
6-Mar-12	161	3.2	164	161	1.02
7-Mar-12	179	3.0	182	179	1.02
8-Mar-12	184	4.5	189	184	1.02
9-Mar-12	166	5.1	171	166	1.03
10-Mar-12	166	5.3	171	166	1.03
11-Mar-12	210	5.2	215	210	1.02
12-Mar-12	177	0.0	177	177	1.00
13-Mar-12	181	0.0	181	181	1.00
14-Mar-12	180	6.1	186	180	1.03
15-Mar-12	181	5.7	187	181	1.03
16-Mar-12	184	5.7	190	184	1.03
17-Mar-12	175	5.7	181	175	1.03
18-Mar-12	167	0.0	167	167	1.00
	157	4.3	161	157	1.03
19-Mar-12 20-Mar-12	* 182 <sub>.</sub>	5 <i>.</i> 6	188	182	1.03
	181	0.0	181	181	1.00
21-Mar-12	179	0.0	179	179	1.00
22-Mar-12	188	0.9	189	188	1.00
23-Mar-12		5.1	190	185	1.03
24-Mar-12	185 61	2.4	63	61	1.04
25-Mar-12			shut in	shut in	shut in
26-Mar-12	shut in	shut in		shut in	shut in
27-Mar-12	shut in	shut in 0.0	shut in 37	37	1.00
28-Mar-12	37			58	1.06
29-Mar-12	58	3.3	61 166	166	1.00
30-Mar-12	166	0.0	166		1.00
31-Mar-12	145	0.0	145	145	1.00

174

2.6

Averages

171

171

1.02

	Injection	Dilution	Total Injection	Return Flow	Ratio Inj/Ret
Date	Flow	Flow	Flow	TOV	myrice
1-Jan-12	347	5.7	353	351	1.00
2-Jan-12	340	6.2	346	360	0.96
3-Jan-12	333	6.6	340	356	0.95
4-Jan-12	347	4.3	351	329	1.07
5-Jan-12	347	5.1	352	341	1.03
6-Jan-12	354	5.1	359	379	0.95
7-Jan-12	333	5. <b>5</b>	339	350	0.97
8-Jan-12	375	5.0	380	390	0.97
9-Jan-12	361	3.4	364	<b>3</b> 70	0.98
10-Jan-12	375	6.5	382	378	1.01
11-Jan-12	368	6.6	375	381	0.98
12-Jan-12	382	0.0	382	394	0.97
13-Jan-12	340	2.8	343	350	0.98
14-Jan-12	368	5.8	374	374	1.00
15-Jan-12	361	6.1	367	369	0.99
16-Jan-12	375	0.0	375	379	0.99
17-Jan-12	361	0.0	361	366	0.99
18-Jan-12	361	5.2	366	373	0.98
19-Jan-12	347	6.4	353	372	0.95
20-Jan-12	shut in	shut in	shut in	shut i <b>n</b>	shut in
21-Jan-12	shut in	shut in	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in	shut in	shut in
24-Jan-12	396	2.6	399	415	0.96
25-Jan-12	347	0.0	347	369	0.94
26-Jan-12	389	5.1	394	369	1.07
27-Jan-12	333	1.8	335	363	0.92
28-Jan-12	368	5.3	373	370	1.01
29-Jan-12	361	5.4	366	371	0.99
30-Jan-12	shut in	shut in	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in	shut in	shut in
1-Feb-12	shut in	shut in	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in	shut in	shut in

15-Feb-12 shut in 16-Feb-12 shut in 17-Feb-12 shut in 18-Feb-12 shut in 19-Feb-12 shut in 20-Feb-12 shut in 21-Feb-12 shut in 22-Feb-12 shut in 23-Feb-12 shut in 24-Feb-12 shut in 25-Feb-12 shut in 26-Feb-12 shut in 27-Feb-12 shut in 28-Feb-12 shut in 29-Feb-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 3-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 208 9-Mar-12 208 9-Mar-12 340 13-Mar-12 340 13-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 18-Mar-12 340 18-Mar-12 340 19-Mar-12 354 20-Mar-12 354 20-Mar-12 354 20-Mar-12 354	shut in shut i	shut in 234 218 211 215	shut in shut i	shut in 1.11 1.05 1.03
17-Feb-12       shut in         18-Feb-12       shut in         19-Feb-12       shut in         20-Feb-12       shut in         21-Feb-12       shut in         23-Feb-12       shut in         24-Feb-12       shut in         25-Feb-12       shut in         26-Feb-12       shut in         29-Feb-12       shut in         29-Feb-12       shut in         29-Feb-12       shut in         3-Mar-12       shut in         3-Mar-12       shut in         4-Mar-12       shut in         5-Mar-12       229         7-Mar-12       215         8-Mar-12       208         9-Mar-12       208         10-Mar-12       24         12-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 6.3	shut in	shut in 211 208 205	shut in 1.11
18-Feb-12       shut in         19-Feb-12       shut in         20-Feb-12       shut in         21-Feb-12       shut in         22-Feb-12       shut in         23-Feb-12       shut in         24-Feb-12       shut in         25-Feb-12       shut in         26-Feb-12       shut in         29-Feb-12       shut in         29-Feb-12       shut in         1-Mar-12       shut in         2-Mar-12       shut in         3-Mar-12       shut in         4-Mar-12       shut in         5-Mar-12       229         7-Mar-12       208         9-Mar-12       208         10-Mar-12       215         11-Mar-12       264         12-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 5.3 3.0 3.1 6.6	shut in	shut in 211 208 205	shut in 1.11
19-Feb-12 shut in 20-Feb-12 shut in 21-Feb-12 shut in 22-Feb-12 shut in 23-Feb-12 shut in 24-Feb-12 shut in 25-Feb-12 shut in 26-Feb-12 shut in 27-Feb-12 shut in 29-Feb-12 shut in 29-Feb-12 shut in 29-Feb-12 shut in 29-Mar-12 shut in 3-Mar-12 shut in 3-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 208 9-Mar-12 208 9-Mar-12 208 10-Mar-12 208 10-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 18-Mar-12 340 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354	shut in 6.3	shut in	shut in 211 208 205	shut in 1.11
20-Feb-12       shut in         21-Feb-12       shut in         22-Feb-12       shut in         23-Feb-12       shut in         24-Feb-12       shut in         25-Feb-12       shut in         26-Feb-12       shut in         27-Feb-12       shut in         29-Feb-12       shut in         1-Mar-12       shut in         2-Mar-12       shut in         3-Mar-12       shut in         5-Mar-12       shut in         6-Mar-12       229         7-Mar-12       215         8-Mar-12       208         9-Mar-12       208         10-Mar-12       215         11-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
21-Feb-12       shut in         22-Feb-12       shut in         23-Feb-12       shut in         24-Feb-12       shut in         25-Feb-12       shut in         26-Feb-12       shut in         27-Feb-12       shut in         28-Feb-12       shut in         29-Feb-12       shut in         3-Mar-12       shut in         3-Mar-12       shut in         4-Mar-12       shut in         5-Mar-12       shut in         6-Mar-12       229         7-Mar-12       215         8-Mar-12       208         9-Mar-12       208         10-Mar-12       215         11-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
22-Feb-12 shut in 23-Feb-12 shut in 24-Feb-12 shut in 25-Feb-12 shut in 26-Feb-12 shut in 27-Feb-12 shut in 28-Feb-12 shut in 29-Feb-12 shut in 29-Feb-12 shut in 24-Mar-12 shut in 3-Mar-12 shut in 3-Mar-12 shut in 5-Mar-12 shut in 5-Mar-12 shut in 229 7-Mar-12 229 7-Mar-12 208 9-Mar-12 208 9-Mar-12 208 10-Mar-12 208 10-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 18-Mar-12 340 19-Mar-12 340 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354 19-Mar-12 340 19-Mar-12 354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
23-Feb-12 shut in 24-Feb-12 shut in 25-Feb-12 shut in 26-Feb-12 shut in 27-Feb-12 shut in 28-Feb-12 shut in 29-Feb-12 shut in 29-Feb-12 shut in 29-Feb-12 shut in 24-Mar-12 shut in 3-Mar-12 shut in 3-Mar-12 shut in 5-Mar-12 shut in 5-Mar-12 shut in 229 7-Mar-12 229 7-Mar-12 208 9-Mar-12 208 9-Mar-12 208 10-Mar-12 208 10-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 18-Mar-12 340 19-Mar-12 340 19-Mar-12 354 19-Mar-12 354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
24-Feb-12       shut in         25-Feb-12       shut in         26-Feb-12       shut in         27-Feb-12       shut in         28-Feb-12       shut in         29-Feb-12       shut in         1-Mar-12       shut in         2-Mar-12       shut in         3-Mar-12       shut in         5-Mar-12       shut in         6-Mar-12       229         7-Mar-12       215         8-Mar-12       208         9-Mar-12       208         10-Mar-12       215         11-Mar-12       264         12-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
25-Feb-12 shut in 26-Feb-12 shut in 27-Feb-12 shut in 28-Feb-12 shut in 29-Feb-12 shut in 1-Mar-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 18-Mar-12 340 19-Mar-12 354 19-Mar-12 354 19-Mar-12 354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11
26-Feb-12 shut in 27-Feb-12 shut in 28-Feb-12 shut in 29-Feb-12 shut in 1-Mar-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 5-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354 19-Mar-12 354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in shut in shut in shut in shut in shut in shut in shut in 1.11
27-Feb-12       shut in         28-Feb-12       shut in         29-Feb-12       shut in         1-Mar-12       shut in         2-Mar-12       shut in         3-Mar-12       shut in         5-Mar-12       shut in         6-Mar-12       229         7-Mar-12       215         8-Mar-12       208         9-Mar-12       208         10-Mar-12       215         11-Mar-12       264         12-Mar-12       340         13-Mar-12       347         15-Mar-12       347         16-Mar-12       340         17-Mar-12       340         18-Mar-12       340         19-Mar-12       354	shut in 5.3 3.0 3.1 6.6	shut in 234 218	shut in 211 208 205	shut in shut in shut in shut in shut in shut in shut in 1.11
28-Feb-12 shut in 29-Feb-12 shut in 1-Mar-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in shut in shut in shut in shut in shut in 1.11 1.05
29-Feb-12 shut in 1-Mar-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	shut in shut in shut in shut in shut in shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in shut in shut in shut in shut in shut in 211 208 205	shut in shut in shut in shut in shut in shut in 1.11 1.05
1-Mar-12 shut in 2-Mar-12 shut in 3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 340 19-Mar-12 354	shut in shut in shut in shut in shut in 5.3 3.0 3.1 6.6	shut in shut in shut in shut in shut in 234 218 211	shut in shut in shut in shut in shut in 211 208 205	shut in shut in shut in shut in shut in 1.11 1.05
2-Mar-12 shut in 3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	shut in shut in shut in shut in 5.3 3.0 3.1 6.6	shut in shut in shut in shut in 234 218 211	shut in shut in shut in shut in 211 208 205	shut in shut in shut in shut in 1.11 1.05
3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 340	shut in shut in shut in 5.3 3.0 3.1 6.6	shut in shut in shut in 234 218 211	shut in shut in shut in 211 208 205	shut in shut in shut in 1.11 1.05
3-Mar-12 shut in 4-Mar-12 shut in 5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 16-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	shut in shut in 5.3 3.0 3.1 6.6	shut in shut in 234 218 211	shut in shut in 211 208 205	shut in shut in 1.11 1.05
4-Mar-12shut in5-Mar-12shut in6-Mar-122297-Mar-122158-Mar-122089-Mar-1220810-Mar-1221511-Mar-1226412-Mar-1234013-Mar-1235414-Mar-1234715-Mar-1234716-Mar-1234017-Mar-1234018-Mar-1234019-Mar-12354	shut in 5.3 3.0 3.1 6.6	shut in 234 218 211	shut in 211 208 205	shut in 1.11 1.05
5-Mar-12 shut in 6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	5.3 3.0 3.1 6.6	234 218 211	211 208 205	1.11 1.05
6-Mar-12 229 7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	3.0 3.1 6.6	218 211	208 205	1.05
7-Mar-12 215 8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	3.1 6.6	211	205	
8-Mar-12 208 9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	6.6			1 NG
9-Mar-12 208 10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354		215	10E	1.03
10-Mar-12 215 11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	0.0		195	1.10
11-Mar-12 264 12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	0.0	215	215	1.00
12-Mar-12 340 13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	3.8	268	289	0.93
13-Mar-12 354 14-Mar-12 347 15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	0.0	340	336	1.01
14-Mar-1234715-Mar-1234716-Mar-1234017-Mar-1234018-Mar-1234019-Mar-12354	0.0	354	363	0.98
15-Mar-12 347 16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	1.8	<b>3</b> 49	355	0.98
16-Mar-12 340 17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	5.5	353	357	0.99
17-Mar-12 340 18-Mar-12 340 19-Mar-12 354	4.9	345	355	0.97
18-Mar-12 340 19-Mar-12 354	4.3	344	356	0.97
19-Mar-12 <b>35</b> 4	0.0	340	354	0.96
	3.5	358	347	1.03
20-Mai-12 010	0.0	<b>3</b> 13	303	1.03
21-Mar-12 326	0.0	326	324	1.01
22-Mar-12 313	0.0	313	<b>3</b> 08	1.02
23-Mar-12 <b>3</b> 13	1.5	315	<b>3</b> 28	0.96
24-Mar-12 313	4.8	318	320	0.99
25-Mar-12 146	2.4	148	146	1.02
26-Mar-12 shut in	shut in	shut in	shut in	shut in
27-Mar-12 shut in	shut in	shut in	shut in	shut in
28-Mar-12 0	0.0	0	75	0.00
29-Mar-12 0	0.0	0	135	0.00
30-Mar-12 shut in		shut in	shut in	shut in
31-Mar-12 shut in	shut in	shut in	shut in	shut in

318

Averages

315

3.3

0.95

326

	Injection	Dilution	Total Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	lnj/Ret
Date	1 1044			particular of an annual control of the control of t	
1-Jan-12	274	0.0	274	274	1.00
2-Jan-12	250	0.0		250	1.00
3-Jan-12	250	0.0	250	250	1.00
4-Jan-12	254	0.0	254	254	1.00
5-Jan-12	277	0.0	277	277	1.00
6-Jan-12	274	0.0	274	274	1.00
7-Jan-12	250	6.0	256	250	1.02
8-Jan-12	274	5.3	279	274	1.02
9-Jan-12	237	0.0	237	237	1.00
10-Jan-12	255	0.0	<b>25</b> 5	255	1.00
11-Jan-12	257	0.0	257	257	1.00
12-Jan-12	263	0.0	263	263	1.00
13-Jan-12	174	0.0	174	174	1.00
14-Jan-12	233	0.0	233	233	1.00
15-Jan-12	242	0.0	242	242	1.00
16-Jan-12	253	0.0	<b>25</b> 3	253	1.00
17-Jan-12	273	0.0	<b>2</b> 73	273	1.00
18-Jan-12	268	0.0	268	268	1.00
19-Jan-12	319	0.0	319	319	1.00
20-Jan-12	260	0.0	<b>2</b> 60	<b>2</b> 60	1.00
21-Jan-12	235	0.0	235	235	1.00
22-Jan-12	264	0.0	264	264	1.00
23-Jan-12	250	0.0	250	250	1.00
24-Jan-12	269	0.0	269	269	1.00
25-Jan-12	233	0.0	233	233	1.00
26-Jan-12	233	0.0	233	233	1.00
27-Jan-12	280	0.0	280	280	1.00
28-Jan-12	278	0.0	278	278	1.00
29-Jan-12	304	0.0	304	304	1.00
30-Jan-12	<b>25</b> 0	0.0	250	250	1.00
31-Jan-12	297	0.0	297	297	1.00
1-Feb-12	304	0.0	304	304	1.00
2-Feb-12	308	0.0	308	308	1.00
3-Feb-12	313	0.0	313	313	1.00
4-Feb-12	295	0.0	295	295	1.00
5-Feb-12	280	0.0	280	280	1.00
6-Feb-12	251	0.0	251	251	1.00
7-Feb-12	268	0.0	268	268	1.00
8-Feb-12	297	0.0	297	297	1.00
9-Feb-12	258	0.0	258	258	1.00
10-Feb-12	176	0.0	176	176	1.00
11-Feb-12	238	0.0	238	238	1.00
12-Feb-12	243	0.0	<b>24</b> 3	243	1.00
13-Feb-12	245	0.0	245	<b>24</b> 5	1.00
14-Feb-12	300	0.0	300	300	1.00
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15-Feb-12	257	0.0	257	257	1.00
16-Feb-12	275	0.0	275	275	1.00
17-Feb-12	259	0.0	259	259	1.00
18-Feb-12	258	0.0	258	258	1.00
19-Feb-12	253	0.0	253	253	1.00
20-Feb-12	281	0.0	281	281	1.00
21-Feb-12	296	0.0	296	296	1.00
22-Feb-12	306	0.0	306	306	1.00
23-Feb-12	298	0.0	298	298	1.00
24-Feb-12	297	0.0	297	297	1.00
25-Feb-12	290	0.0	290	290	1.00
26-Feb-12	277	0.0	277	277	1.00
27-Feb-12	271	5.0	276	271	1.02
28-Feb-12	327	0.0	327	327	1.00
29-Feb-12	290	0.0	290	290	1.00
1-Mar-12	283	0.0	283	283	1.00
2-Mar-12	280	0.0	280	280	1.00
3-Mar-12	316	0.0	316	316	1.00
4-Mar-12	266	0.0	266	266	1.00
5-Mar-12	277	0.0	277	277	1.00
6-Mar-12	304	0.0	304	304	1.00
7-Mar-12	301	0.0	301	301	1.00
8-Mar-12	293	0.0	293	293	1.00
9-Mar-12	267	0.0	267	267	1.00
10-Mar-12	281	0.0	281	281	1.00
11-Mar-12	281	0.0	281	281	1.00
12-Mar-12	295	0.0	295	295	1.00
13-Mar-12	325	0.0	325	325	1.00
14-Mar-12	268	0.0	268	268	1.00
15-Mar-12	295	0.0	295	295	1.00
16-Mar-12	272	0.0	272	272	1.00
17-Mar-12	280	0.0	280	280	1.00
18-Mar-12	286	0.0	286	286	1.00
19-Mar-12	286	0.0	286	286	1.00
20-Mar-12	318	0.0	318	318	1.00
	340	0.0	340	340	1.00
21-Mar-12		0.0	208	208	1.00
22-Mar-12	208	0.0	312	312	1.00
23-Mar-12	312		361	361	1.00
24-Mar-12	361	0.0	181	181	1.00
25-Mar-12	181	0.0		shut in	shut in
26-Mar-12	shut in	shut in	shut in	shut in	shut in
27-Mar-12	shut in	shut in	shut in		1.00
28-Mar-12	46	0.0	46	46	
29-Mar-12	81	0.0	81	81 227	1.00
30-Mar-12	327	0.0	327	327	1.00
31-Mar-12	231	0.0	231	231	1.00
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Averages	269	0.2	26 <del>9</del>	269	1.00
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			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
100	Commence of Street and Company of the Commence	D			
1-Jan-12	shut in	shut in	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in	shut in	shut in
1-Feb-12	shut in	shut in	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in	shut in	shut in
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Averages	shut in				
O I IVIGI 12	OTTOWN IT	2	·		
31-Mar-12	shut in				
30-Mar-12	shut in				
29-Mar-12	shut in				
28-Mar-12	shut in				
26-Mar-12 27-Mar-12	shut in				
25-Mar-12	shut in shut in	shut in	shut in	shut in	shut in
24-Mar-12	shut in	shut in shut in	shut in	shut in	shut in
23-Mar-12	shut in	shut in	shut in shut in	shut in	shut in
22-Mar-12	shut in				
21-Mar-12	shut in				
20-Mar-12	shut in				
19-Mar-12	shut in				
18-Mar-12	shut in	shut in		shut in	shut in
17-Mar-12	shut in	shut in	shut in shut in	shut in	shut in
16-Mar-12	shut in	shut in		shut in	shut in
15-Mar-12	shut in				
14-Mar-12	shut in	shut in	shut in shut in	shut in	shut in
13-Mar-12	shut in				
12-Mar-12	shut in				
11-Mar-12	shut in				
10-Mar-12	shut in				
9-Mar-12	shut in				
8-Mar-12	shut in	shut in		shut in	shut in
7-Mar-12	shut in				
6-Mar-12	shut in	shut in	shut in shut in	shut in	shut in
5-Mar-12	shut in				
4-Mar-12	shut in	shut in	shut in	shut in shut in	shut in
3-Mar-12	shut in				
2-Mar-12	shut in				
1-Mar-12	shut in				
29-Feb-12	shut in	shut in	shut in	shut in	shut in shut in
28-Feb-12	shut in				
27-Feb-12	shut in				
26-Feb-12	shut in				
25-Feb-12	shut in				
24-Feb-12	shut in				
23-Feb-12	shut in				
22-Feb-12	shut in				
21-Feb-12	shut in				
20-Feb-12	shut in				
19-Feb-12	shut in				
18-Feb-12	shut in				
17-Feb-12	shut in				
16-Feb-12	shut in				
15-Feb-12	shut in				

	Injection	Dilution	Total Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
1-Jan-12	176	0.0	176	176	1.00
2-Jan-12	166	0.0	166	166	1.00
3-Jan-12	158	0.0	158	158	1.00
4-Jan-12	167	0.0	167	167	1.00
5-Jan-12	173	0.0	173	173	1.00
6-Jan-12	149	5.8	155	149	1.04
7-Jan-12	129	0.0	129	129	1.00
8-Jan-12	130	0.0	130	130	1.00
9-Jan-12	117	0.0	117	117	1.00
10-Jan-12	163	0.0	163	163	1.00
11-Jan-12	134	0.0	134	134	1.00
12-Jan-12	122	0.0	122	122	1.00
13-Jan-12	156	0.0	156	156	1.00
14-Jan-12	119	0.0	119	119	1.00
15-Jan-12	106	0.0	106	106	1.00
16-Jan-12	127	0.0	127	127	1.00
17-Jan-12	99	0.0	99	99	1.00
18-Jan-12	158	0.0	158	158	1.00
19-Jan-12	222	0.0	222	222	1.00
20-Jan-12	172	0.0	172	172	1.00
21-Jan-12	126	0.0	126	126	1.00
22-Jan-12	170	0.0	170	170	1.00
23-Jan-12	146	0.0	146	146	1.00
24-Jan-12	118	0.0	118	118	1.00
25-Jan-12	89	0.0	89	89	1.00
26-Jan-12	89	0.0	89	89	1.00
27-Jan-12	98	0.0	98	98	1.00
28-Jan-12	85	0.0	85	85	1.00
29-Jan-12	98	0.0	98	98	1.00
30-Jan-12	179	0.0	179	179	1.00
31-Jan-12	117	0.0	117	117	1.00
1-Feb-12	117	0.0	117	117	1.00
2-Feb-12	123	0.0	123	123	1.00
3-Feb-12	114	0.0	114	114	1.00
4-Feb-12	98	0.0	98	98	1.00
5-Feb-12	92	0.0	92	92	1.00
6-Feb-12	107	0.0	107	107	1.00
7-Feb-12	89	0.0	89	89	1.00
8-Feb-12	108	0.0	108	108	1.00
9-Feb-12	135	0.0	135	135	1.00
10-Feb-12	86	0.0	86	86	1.00
11-Feb-12	158	0.0	158	158	1.00
12-Feb-12	306	0.0	306	306	1.00
13-Feb-12	130	0.0	130	130	1.00
14-Feb-12	137	0.0	137	137	1.00

			,	•	
15-Feb-12	125	0.0	125	125	1.00
16-Feb-12	122	0.0	122	122	1.00
17-Feb-12	115	0.0	115	115	1.00
18-Feb-12	257	0.0	257	257	1.00
19-Feb-12	119	0.0	119	119	1.00
20-Feb-12	120	0.0	120	120	1.00
21-Feb-12	124	0.0	124	124	1.00
22-Feb-12	116	0.0	116	116	1.00
23-Feb-12	107	0.0	107	107	1.00
24-Feb-12	136	0.0	136	136	1.00
25-Feb-12	128	0.0	128	128	1.00
26-Feb-12	108	0.0	108	108	1.00
27-Feb-12	159	0.0	159	159	1.00
28-Feb-12	137	0.0	137	137	1.00
29-Feb-12	117	0.0	117	117	1.00
1-Mar-12	153	0.0	153	153	1.00
2-Mar-12	135	0.0	135	135	1.00
3-Mar-12	135	0.0	135	135	1.00
4-Mar-12	111	0.0	111	111	1.00
	94	0.0	94	94	1.00
5-Mar-12	94 94	0.0	94	94	1.00
6-Mar-12	100	0.0	100	100	1.00
7-Mar-12		0.0	108	108	1.00
8-Mar-12	108	0.0	101	101	1.00
9-Mar-12	101		126	126	1.00
10-Mar-12	126	0.0	135	135	1.00
11-Mar-12	135	0.0		132	1.00
12-Mar-12	132	0.0	132	130	1.00
13-Mar-12	130	0.0	130	131	1.00
14-Mar-12	131	0.0	131	115	1.00
15-Mar-12	115	0.0	115	117	1.00
16-Mar-12	117	0.0	117		1.00
17-Mar-12	110	0.0	110	110	1.00
18-Mar-12	107	0.0	107	107	
19-Mar-12	119	0.0	119	119	1.00
20-Mar-12	130	0.0	130	130	1.00
21-Mar-12	107	0.0	107	107	1.00
22-Mar-12	96	0.0	96	96	1.00
23-Mar-12	90	0.0	90	90	1.00
24-Mar-12	97	0.0	97	97	1.00
25-Mar-12	71	0.0	71	71	1.00
26-Mar-12	shut in	shut in	shut in	shut in	shut in
27-Mar-12	shut in	shut in	shut in	shut in	shut in
28-Mar-12	shut in	shut in	shut in	shut in	shut in
29-Mar-12	7	0.0	7	7	1.00
30-Mar-12	159	0.0	159	159	1.00
31-Mar-12	135	0.0	135	135	1.00
Averages	127	0.1	127	127	1.00

			Total		
	Injection	Dilution	Injection	Return	Ratio
Date	Flow	Flow	Flow	Flow	Inj/Ret
	2,00 <u>-20</u>		1000		
1-Jan-12	shut in	shut in	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in	shut in	shut in
1-Feb-12	shut in	shut in	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in	shut in	shut in

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15-Feb-12	shut in				
16-Feb-12	shut in				
17-Feb-12	shut in				
18-Feb-12	shut in				
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26-Feb-12	shut in				
27-Feb-12	shut in				
28-Feb-12	shut in				
29-Feb-12	shut in				
1-Mar-12	shut in				
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3-Mar-12	shut in				
4-Mar-12	shut in				
5-Mar-12	shut in				
6-Mar-12	shut in				
7-Mar-12	shut in				
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9-Mar-12	shut in				
10-Mar-12	shut in				
11-Mar-12	shut in				
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13-Mar-12	shut in				
14-Mar-12	shut in				
15-Mar-12	shut in				
16-Mar-12	shut in				
17-Mar-12	shut in				
18-Mar-12	shut in				
19-Mar-12	shut in				
20-Mar-12	shut in				
21-Mar-12	shut in				
22-Mar-12	shut in				
23-Mar-12	shut in				
24-Mar-12	shut in				
25-Mar-12	shut in				
26-Mar-12	shut in				
27-Mar-12	shut in				
28-Mar-12	shut in				
29-Mar-12	shut in				
30-Mar-12	shut in				
31-Mar-12	shut in				

shut in

shut in

Averages

shut in

shut in

shut in

Cluster 1 2012 Monitor Well Results 1st Quarter

Date	Well Number	Chloride Concentration (mg/L)
March 2012	Cluster 1 M.W. 1	230.4
March 2012 March 2012 March 2012 March 2012	Cluster 1 M.W. 2 Cluster 1 M.W. 3 Cluster 1 M.W. 4 Cluster 1 M.W. 5	429.0 35.5 1,435.8 826.1
March 2012 March 2012 March 2012 March 2012	Cluster 1 M.W. 6 Cluster 1 M.W. 7 Cluster 1 M.W. 8 Cluster 1 M.W. 9	177.3 496.3 411.3 7,622.4
March 2012 March 2012 March 2012 March 2012 March 2012	Cluster 1 M.W. 10 Cluster 1 M.W. 11 Cluster 1 M.W. 12 Cluster 1 M.W. 13	1,134.5 432.5 585.0
March 2012 March 2012 March 2012	Cluster 1 M.W. 14 Cluster 1 M.W. 34 Cluster 1 M.W. 35	4,644.3 234.0 1,967.6 109.9
March 2012 March 2012 March 2012 March 2012 March 2012	Cluster 1 M.W. 36 Cluster 1 M.W. 37 Cluster 1 M.W. 38 Cluster 1 M.W. 39 Cluster 1 M.W. 40	14.2 2,659.0 7.1 7.1 205.6

#### Cluster 2 2012 Monitor Well Results 1st Quarter

Date	Weil Number	Chloride Concentration (mg/L)
March 2012	Cluster 2 M.W. 1	No sample
March 2012	Cluster 2 M.W. 2	Dry well
March 2012	Cluster 2 M.W. 4	109.9
March 2012	Cluster 2 M.W. 5	127.6
March 2012	Cluster 2 M.W. 6	12.4
March 2012	Cluster 2 M.W. 33	37.2

Thomas 1-26 2012 Monitor Well Results 1st Quarter

Date	Well Number	Chloride Concentration (mg/L)
March 2012	Thomas 1-26 M.W. 1	53.2
March 2012	Thomas 1-26 M.W. 2	3.6
March 2012	Thomas 1-26 M.W. 3	7.1
March 2012	Thomas 1-26 M.W. 4	56.7
March 2012	Thomas 1-26 M.W. 5	0

### Woodward 1-26 2012 Monitor Well Results 1st Quarter

 · ·		
Date	Well Number	Chloride Concentration (mg/L)
March 2012	Woodward 1-26 M.W. 1	19.5
March 2012	Woodward 1-26 M.W. 2	5.3

#### MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

DATE SAMPLED	TIME SAMPLED	SAMPLE#	SAMPLER	NAME/SIGNATURE
	745 A.M	\ 1 (PP-1)	www.fiedistration.V	3
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unding management and the statement of t	manufacture of the second of t	والمراب وعله وبالما والمستدرة والمتارك والمتارك والمتارك والمنارك والمتارك والمتارك والمتارك	armania kanggunahan badan kanggunahan interpersional kang sanggunahan kanggunahan kanggunahan kanggunahan kanggunahan kanggunahan kanggunahan kanggunahan kanggunahan k	ra makkan diginak pantain diginak paka menang m Si Salah
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Manual Canada and Barbaran and	T.F. T.	17 (01.2-5)	Cata T	
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7-13	11:40 A. V	34 (T-126-1)	at f	
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3-7-12	and the second s	Y) 26 (T-126-2)	and the second s	anger of mining to refer to the state of the
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7-7-12		29 (T-126-4)	and the second s	
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A STATE OF THE PROPERTY OF THE	10115A	1131 (CL 1-14)	Anton	DILL.
7-7-12	TANA	1732 (PW-32)	and the second	SUPPLY AND DESCRIPTION OF THE PROPERTY OF THE
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DESTRICT HE LAND	<u>v (Mame/Signature)</u>	Umm Va	allo	
		VAVILLAN MAN	S KI 'S	: .

Date Received R: 3/1/12

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50PM

### MOSAIC POTASH HERSEY MONITORING WELLS CHAIN OF CUSTODY

	DATE SAMPLED	TIME SAMPLED	SAMPLE #	SAMPLER!	NAME/SIGNATURE	
			1 (PP-1)			
	CONTRACTOR OF THE PROPERTY OF THE WAY SEED OF THE PROPERTY OF	Medical September 1994 of Management Projective September 1994 (1994) and the september 1994 (1994)	2 (PF-2)	noversities de l'amente, es producter l'époque l'ancochain Ville de l'époque de l'amente	kapangan rakaman inta intangkapangkapangkapan kanamanapangkan amangan-kanapangkapan periodi di kanamanapan ka	MATERIAL PROPERTY MARCHANGERS
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	$\frac{1}{2} \int_{\mathbb{R}^{2}} dx  dx  dx  dx  dx  dx  dx  dx$	क्षेत्रीराज्योत्राक्षात् पृत्ते तथा स्रोत्त्राक्ष्यक्षिणे राज्याद्वात्राच्या देश क्षात्राच्याते करा पुर्वनार देन्द्रेय ज्ञान्त्र	9 (GL2-4)	AND THE PROPERTY OF THE PROPER	and the second state of the second	en a minylinelieud conferiorium e e en
	Dry Well	ده سازه استور استوره این در در در سازه این استور استور استوره این این استوره این استوره این استوره این استوره در در د	10 (CL2-2)	C. C	2. 1995年1月1日 - 1995年1月1日 - 1995年1日 - 1995年1月1日 - 1995年1月1日 - 1995年1日 - 1995年1日 - 1995年1日 - 1995年1日 - 1995年1日 -	AND THE PROPERTY OF THE PERSON NAMED IN
	त्रभागितिकतः सुर्मात् कृति क्षेत्रके स्वतिकारिय कावकार करते द्वारा कावकार कृति । स्वतः कावकारिया कावकार कावकार स्वतानियक्षितः	en tikullenniya menenga menenga menengan kebuanan tibinanan ya ke <sub>lema</sub> a delaman mendelamba,		- STEER OF THE PROPERTY OF THE	والمرافز والمهرون والمهود والمهار الموالي أردانها والمالية والمالية والمالية والمالية والمالية والمالية والمالية	Management and the North Printers Spill Sp
	The Self of the second property of the self of the sel	त्त्री कर ने के क्षेत्र का क्षेत्र का कारण के कारण होता है जाते हैं। का	12 (C.L.1-6)	# ATRINGTO CONTRACTOR	人名比尔 医马克尔氏氏 网络阿尔斯 化共同的 医克里特 化二烷 人名英格兰 化二烷 医克尔特氏 医克尔特氏 医克尔特氏 化二烷	Minipal Commitment of Carlo
	$s_{1/2} s_{2/2} s_{2$	نىڭ يىدىنى يىدىنى ئىدىنىڭ ئىدىنىڭ ئىدىنى بىدىنى بىدىنى ئىدىنىنىڭ يايىنى ئىدىنىڭ يايىنىڭ ئىدىنىڭ ئىدىنىڭ ئىدىنىڭ ئىدىنى ئىدىنىڭ	13 (CL1-5)	A - A Nove of Street, and the second street, and the second second second second second second second second s	大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大	A Rest Color
	भी विक्रियोत् स्वापात् अप्रतिकार् वेद्रभावात् प्रदेशकार्यः । विद्यार्थक्ति स्वापात्रात् विद्यार्थक्ति स्वापात्	ىنىدىغىنى <u>ت سەرەبىلىنى د</u> ەنەدەكىنىدۇنىي دۇنىيىدىدىنىنىدىدىدىدىدىدىدىدىدىدىدىدىدىدى	14 (GL)-7)	ergi (Nyiga) <u>Ergesteri ika</u> erantiikiektore <sub>e</sub> diki kedikivikisejenk	DV(1)45(D)中的40(D)(4)4(B)27(A) 40(B)38(A)(2)4(B)4(B)4(B)4(B)4(B)4(B)4(B)4(B)4(B)4(B	FB: THE SALES OF SECURITY SEC
	egiliganingssande er Köldingade in desidet er desig jig dassi de disabed desilikan seran	مان من المناطق	75 (CL 1-1)	### PAPENTERPHONE TO THE PROPERTY OF THE PROPE	1984 states aller i populari e comentari de la mentari que se conserva e populari e de conserva de la conserva	YSAMANGARIANA ISANGIQUESSA
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	паменары да памена жана учере фарацов 18 байн даудырды	ith kinderstander und gegensche Willem in en die viert der Zein auf ein eine Stein	24 (T-126-1)	A TANK TO A TOWN THE PROPERTY PROPERTY OF THE	《大大大学》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《大学社》,《	Mentar Herrichten tre-elements
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66	१९४४ विकेशना स्टब्स्य मानुसूद्धार विकास स्टब्स्यास्य विकास स्टब्स्यास्य विकास स्टब्स्या स्टब्स्या विकास विकास	rallyfilliann y finnynti, tyrbig oa gyglatherganes y new yn yn y 2 2 ffynyn y gynnorw.	26 (T-126-2)	and a manifest furthering in systems of the electrical properties from the Properties	بسيكني وكيام ويوي بالروي بالروي والمساوم المعاوية ويوسع والمناور و	e and an experimental services of the services
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	era vez erkij igrenje sy governi karlipetin poklasnikom kraji izborji i Nibora kaj proportina politi	anticoning phonones by 1883 and investigation of the production of plants and a series of	29 (1-126-4)	<u>ĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸĸ</u>	The second contract of	The state of the s
	3712	9:557	JP2 30 (CL1-13)	Clarlens	TOTAS	Challedon and all specific washing to
	राद्रान्त्रमध्येत्राहेर् <mark>त्रस्य</mark> केरेश्वराक्षासम्बद्धाः स्थापन्त्रस्य स्थापना स्थापना स्थापना स्थापना स्थापना स्थापना	and processing the Association and Association and Association of Association (Association Association)	31 (CL1-14)	Mary and the last of the last	And the second s	ANTERNATION IN ACCUMUNTATION OF
	College of Library of Library College and College of Co	a nakonina reggy pina sekilah basa dekina (1941, dipina, sekila pina (1, ililan pina makana)	32 (PW-32)	and the second s	できる人がある。 14 とのは、大田田田田では中国日本の大田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田田	huicheunfahrt, gula hallsakm
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	فالمطاولة المتراسة والراوال المتعمدة فأداء معمدة كأمدون وندو تباريس وويورو	A STATE OF THE PARTY OF THE PAR	The state of the s	والمساعلة ومعارضه المستهدي ويستهد والمهارة والمتحارث والمستعد والمستعددة والمستعددة والمستعددة والمستعددة والمستعددة	and for a victiz secularization in the free for the letter and published a filter than the letter the victoria	The state of the s

Received in Lab By (Name/Signature)

Date Received

Time Received

11:30Am Min VanCo





March 27, 2012

Mosaic Potash - Hersey Attn: Ms. Allison VanOs 1395 - 135th Avenue Hersey, MI 49639

#### **Project: Quarterly Monitoring of Inorganic Pollutants**

Dear Ms. Allison VanOs,

Enclosed is a copy of the laboratory report for the following work order(s) received by TriMatrix Laboratories:

Work Order	Received	Description
1203194	03/14/2012	Laboratory Services

This report relates only to the sample(s) as received. Test results are in compliance with the requirements of the National Environmental Laboratory Accreditation Program (NELAP) and/or one of the following certification programs:

ACLASS DoD-ELAP/ISO17025 (#ADE-1542); Arkansas DEP (#10-046-0); Florida DEP (#E87622-24); Georgia EPD (#E87622-24); Illinois DEP (#002841); Kansas DPH (#E-10302); Kentucky DEP (#0021); Louisiana DEP (#03068); Michigan DPH (#0034); Minnesota DPH (#367345); New York ELAP (#44950); North Carolina DNRE (#659); Texas CEQ (#T104704495-11-1); Virginia DCLS (#1239); Wisconsin DNR (#999472650); USDA Soil Import Permit (#P330-09-00163).

Any qualification or narration of results, including sample acceptance requirements and test exceptions to the above referenced programs, is presented in the Statement of Data Qualifications section of this report. Estimates of analytical uncertainties and certification documents for the test results contained within this report are available upon request.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Jennifer L. Rice Project Chemist



Client:

Matrix:

Lab Sample ID:

Mosaic Potash - Hersey

1203194-01

Water

Project: Client Sample ID: Disposal

Quarterly Monitoring of Inorgani¢ Pollutants

1203194

Work Order: Laboratory Services

Description: Sampled:

03/13/12 07:45

Sampled By:

N.T.

Received:

03/14/12 10:15

#### Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Barium	140	10	ug/L	1.	USEPA-601.0C	03/19/12 12:15	KLV	1203281
Calcium	380	0.50	mg/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Cobalt	61	10	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Copper	110	10	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Iron	1000	50	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Lead	<50	50	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Magnesium	73	0.50	mg/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
Manganese	4300	10	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281
*Selenium	16	5.0	ug/L	5	USEPA-6020A	03/22/12 13:50	DSC	1203465
Sodium	13000	50	mg/L	100	USEPA-6010C	03/19/12 11:40	KLV	1203281
Zinc	150	20	ug/L	1	USEPA-6010C	03/19/12 12:15	KLV	1203281

\*See Statement of Data Qualifications Page 2 of 10



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Disposal

Lab Sample ID:

1203194-01

Matrix:

Water

Work Order:

1203194

Description:

Laboratory Services

Sampled:

03/13/12 07:45

Sampled By:

N.T.

Received:

03/14/12 10:15

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Chloride	23000	500	mg/L	500	SM 4500-C( E 20th	03/19/12 14:01	LMA	1203473
Conductivity @ 25° C	62530	5	umhos/cm	.1	SM 2510 B 20th	03/22/12 15:40	KCS	1203650
*pH	7.4	1.0	pH Units	1.	SM 4500-H B 20th	03/14/12 15:15	SKA	1203293
Oxidation/Reduction Potential	328	1.	mV	1	ASTM D 1498-76	03/16/12 07:00	LMA	1203359
Alkalinity, Bicarbonate	150	20	mg/L	1	SM 2320 B 20th	03/15/12 15:00	SKA	1203304
Alkalinity, Carbonate	<20	20	mg/L	1.	SM 2320 B 20th	03/15/12 15:00	SKA	1203307
Alkalinity, Total	150	20	mg/L	1	SM 2320 B 20th	03/15/12 15:00	SKA	1203306
*Bromide	<300	300	mg/L	100	ASTM D 1246-95 (99)	03/22/12 13:32	KCS	1203636
Sulfate	310	50	mg/L	10	ASTM D516-90 (02)	03/19/12 15:04	LMA	1203470
Residue, Dissolved @ 180° C	44600	2500	mg/L	1	SM 2540 C 20th	03/19/12 11:40	KCS	1203443
Specific Gravity	1.0328	0.7000	@ 60 °F	1	ASTM D 1429-79	03/23/12 10:15	HLB	1203778
Carbon, Total Organic	1.8	1.0	mg/L	1	SM 5310 C 20th	03/22/12 13:58	LMA	1203696
*Sulfide, Total	<1.0	1.0	mg/L	1	SM 4500-S2 F 20th	03/15/12 11:00	KAR	1203408



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle Lab Sample ID:

Water

Matrix:

1203194-02

Work Order:

1203194

Description:

Laboratory Services

Sampled:

03/13/12 08:00

Sampled By:

N.T.

Received:

03/14/12 10:15

#### Total Metals by EPA 6000/7000 Series Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
*Barium	220	50	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Calcium	1500	2.5	mg/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Cobalt	<50	50	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Copper	<50	50	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Iron	1700	250	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Lead	<250	250	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Magnesium	100	2.5	mg/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
×Manganese	170	50	ug/L	5	USEPA-6010C	03/19/12 12:04	KLV	1203281
*Selenium	<25	25	ug/L	25	USEPA-6020A	03/22/12 13:16	DSC	1203465
Sodium	100000	250	mg/L	500	USEPA-6010C	03/19/12 11:51	KLV	1203281
*Zinc	<100	100	ug/L	5	USEPA-601.0C	03/19/12 12:04	KLV	1203281



Client:

Mosaic Potash - Hersey

Project:

Quarterly Monitoring of Inorganic Pollutants

Client Sample ID: Recycle Lab Sample ID:

1203194-02

Matrix:

Water

Work Order:

1203194

Description:

Laboratory Services

Sampled:

03/13/12 08:00

Sampled By:

N.T.

Received:

03/14/12 10:15

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Analyte	Analytical Result	RL	Unit	Dilution Factor	Method	Date Time Analyzed	Ву	QC Batch
Alkalinity, Bicarbonate	38	20	mg/L	1	SM 2320 B 20th	03/15/12 15:00	SKA	1203304
Alkalinity, Carbonate	<20	20	mg/L	1	SM 2320 B 20th	03/15/12 15:00	SKA	1203307
*Bromide	1000	600	mg/L	200	ASTM D 1246-95 (99)	03/22/12 13:32	KCS	1203636
Conductivity @ 25° C	204000	5	umhos/cm	1.	SM 2510 B 20th	03/22/12 15:40	KCS	1203650
Specific Gravity	1.2106	0.7000	@ 60 °F	1	ASTM D 1429-79	03/23/12 10:15	HLB	1203778
Carbon, Total Organic	<1.0	1.0	mg/L	1	SM 5310 C 20th	03/22/12 14:09	LMA	1203696
Alkalinity, Total	38	20	mg/L	1	SM 2320 B 20th	03/15/12 15:00	SKA	1203306
Oxidation/Reduction Potential	296	1	mV	1	ASTM D 1498-76	03/16/12 07:00	LMA	1203359
*p <b>H</b>	6,5	1.0	pH Units	1	SM 4500-H B 20th	03/14/12 15:15	SKA	1203293
Residue, Dissolved @ 180° C	338000	5000	mg/L	1	SM 2540 C 20th	03/19/12 11:40	KCS	1203443
Chloride	190000	2500	mg/L	2500	SM 4500-Cl E 20th	03/19/12 14:01	LMA	1203473
Sulfate	2400	500	mg/L	100	ASTM D516-90 (02)	03/19/12 13:50	LMA	1203470
*Sulfide, Total	6,6	1.0	mg/L	1	SM 4500-S2 F 20th	03/15/12 11:00	KAR	1203408



#### STATEMENT OF DATA QUALIFICATIONS

#### Total Metals by EPA 6000/7000 Series Methods

Barium

Qualification: The RL for this analysis has been elevated due to sample matrix interference.

Analysis: USEPA-6010C

Sample/Analyte: 1203194-02 Recycle

Recycle Calcium 1203194-02 Cobalt 1203194-02 Recycle 1.203194-02 Recycle Copper 1203194-02 Recycle Iron Recycle Lead 1203194-02 Recycle 1203194-02 Magnesium Recycle 1203194-02 Manganese

1203194-02 Recycle Zinc

Analysis: USEPA-6020A

Sample/Analyte: 1203194-01 Disposal

1203194-01DisposalSelenium1203194-02RecycleSelenium



#### STATEMENT OF DATA QUALIFICATIONS

#### Physical/Chemical Parameters by EPA/APHA/ASTM Methods

Qualification: The quality control batch(s), associated with the following samples and analyses, do not contain an

MS/MSD or MS/DUP because client specific matrix QC was not requested. An LCS and LCSD were

analyzed as the measure of batch precision and accuracy.

Analysis: ASTM D 1246-95 (99)

Sample/Analyte: 1203194-01

Disposal

Bromide

1203194-02

Recycle

Bromide

Analysis: SM 4500-S2 F 20th

Sample/Analyte: 1203194-01

Disposal

Sulfide, Total

1203194-02

Recycle

Sulfide, Total

Qualification: The referenced method requires analysis occur immediately after sample collection. Since the

analysis was not performed in the field, the reported result is considered estimated.

Analysis: SM 4500-H B 20th

Sample/Analyte: 1203194-01

Disposal

рΗ

1203194-02

Recycle

рΗ

Qualification: The following reported test methods and analyte(s) are exceptions to our NELAP Fields of Accreditation,

or for which accreditation is not required, applicable, or available.

Analysis: ASTM D 1429-79

Analyte(s): Specific Gravity

Analysis: ASTM D 1498-76

Analyte(s): Oxidation/Reduction Potential



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SA	MPLE RECEIVING	LOG-IN CHECKLIST	
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#### SAMPLE PRESERVATION VERIFICATION FORM

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COC Line #4	Li. Zitue PisOH	Sice H <sub>N</sub> SO.	Dete: 19 Brown H <sub>2</sub> SO <sub>4</sub>		Green None	Red HNO <sub>3</sub>	15 Red Strips HNOs	ANER TYPES	ptl. Add up to, be exceed 2x the volume added at contain table below for in used). Add oran sample contains requirement from Do not add container types:  Container Type 5  500  1006  Container Type 4  128  250	ust do not durine initially ar prep (see this) volume to rend record ested.  pH on this usi pH for 3, 6, and 15  Original Vol.  Prescrivative (mL)  NaOH  2,5  5,0  H_SO.  2,5  1,0
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Page 10 of 10



March 12, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604



MAR 1 5 2012

Attn: Lisa Perenchio

RE: Class III Solution Mining Wells
Permit No. MI-133-3G-A002
Monthly Report for February 2012



During the month of February, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 29 days this month.
- Cavity KCl 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 29 days this month.
- Cavity KCI 1060 was not in operation for this month.
- Cavity KCI 2030 was in operation for 29 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 29 days this month.
- Cavity KCl 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments



MAR 1 5 2012

UIC BRANCH EPA, REGION 5

## CAVITY 1010

# RECEIVED

MAR 1 5 2012

UIC BRANCH EPA, REGION 5

Cavity 1010

#### Daily Averages

_	Injection	Injection	Return
Date	Pressure	Flow	Flow
eppsychia i i i i i i i i i i i i i i i i i i	(psi)	(gpm)	(gpm)
1-Feb-12	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in
15-Feb-12	shut in	shut in	shut in
16-Feb-12	shut in	shut in	shut in
17-Feb-12	shut in	shut in	shut in
18-Feb-12	shut in	shut in	shut in
19-Feb-12	shut in	shut in	shut in
20-Feb-12	shut in	shut in	shut in
21-Feb-12	shut in	shut in	shut in
22-Feb-12	shut in	shut in	shut in
23-Feb-12	shut in	shut in	shut in
24-Feb-12	shut in	shut in	shut in
25-Feb-12	shut in	shut in	shut in
26-Feb-12	shut in	shut in	shut in
27-Feb-12	shut in	shut in	shut in
28-Feb-12	shut in	shut in	shut in
29-Feb-12	shut in	shut in	shut in



MAR 1 5 2012

### CAVITY 1020

# RECEVED

MAR 1 5 2012

Cavity 1020

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Feb-12	1069	243	251
2-Feb-12	1036	262	270
3-Feb-12	1063	270	271
4-Feb-12	1105	273	262
5-Feb-12	1113	233	247
6-Feb-12	1081	271	274
7-Feb-12	1082	268	268
8-Feb-12	1104	294	301
9-Feb-12	1153	271	260
10-Feb-12	1153	202	195
11-Feb-12	1163	252	253
12-Feb-12	1170	250	264
13-Feb-12	1160	257	261
14-Feb-12	1154	292	292
15-Feb-12	1174	281	287
16-Feb-12	1161	303	307
17-Feb-12	1175	298	298
18-Feb-12	1161	290	294
19-Feb-12	√1185	300	303
20-Feb-12	1160	323	327
21-Feb-12	1153	319	317
22-Feb-12	1171	326	324
23-Feb-12	1178	306	308
24-Feb-12	1146	313	315
25-Feb-12	1133	333	333
26-Feb-12	1139	319	317
27-Feb-12	1137	354	367
28-Feb-12	1143	367	362
29-Feb-12	1148	<b>372</b>	368



MAR 1 5 2012

#### Cavity 1020

Feb-12 Monthly Averages

Injection Pressure (psi)

1137

Injection Flow (gpm)

291

Return Flow (gpm)

293

Maximum Injection Pressure and corresponding Injection Flow

Date

19-Feb-12

Injection Pressure (psi)

1185

Injection Flow (gpm)

300

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

2-Feb-12

1036

262

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

29-Feb-12

Injection Flow (gpm)

372

Injection Pressure (psi)

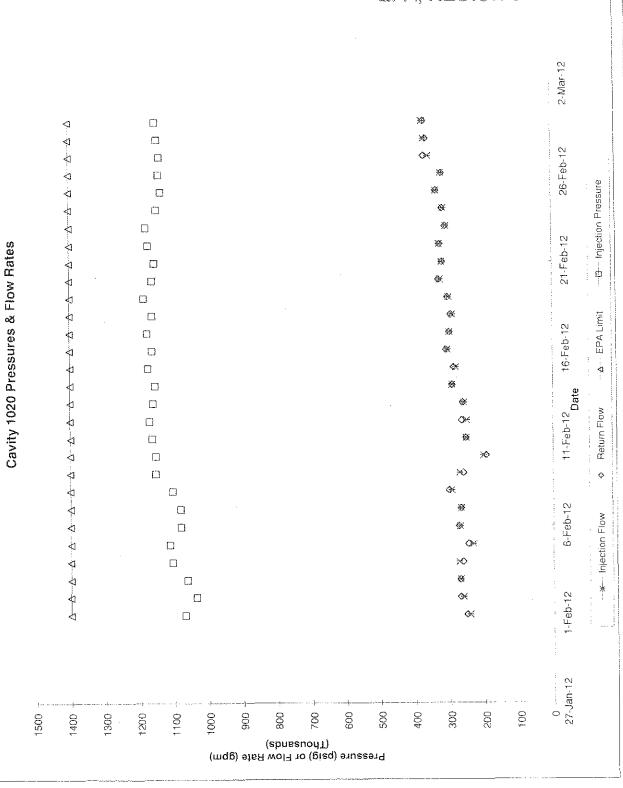
1148

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## UCBRANCH

EPA, REGION 5



Solution Mining Permit MI-133-3G-A002

### CAVITY 1040

# RECEIVED

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Cavity 1040

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Feb-12	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in
15-Feb-12	shut in	shut in	shut in
16-Feb-12	shut in	shut in	shut in
17-Feb-12	shut in	shut in	shut in
18-Feb-12	shut in	shut in	shut in
19-Feb-12	shut in	shut in	shut in
20-Feb-12	shut in	shut in	shut in
21-Feb-12	shut in	shut in	shut in
22-Feb-12	shut in	shut in	shut in
23-Feb-12	shut in	shut in	shut in
24-Feb-12	shut in	shut in	shut in
25-Feb-12	shut in	shut in	shut in
26-Feb-12	shut in	shut in	shut in
27-Feb-12	shut in	shut in	shut in
28-Feb-12	shut in	shut in	shut in
29-Feb-12	shut in	shut in	shut in



MAR I 5 2012

### CAVITY 1050



MAR 1 5 2012

MAR 1 5 2012

### Cavity 1050

### UIC BRANCH EPA REGION 5

### Daily Averages

Date	njection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Feb-12	1193	158	158
2-Feb-12	1173	165	165
3-Feb-12	1183	166	166
4-Feb-12	1200	162	162
5-Feb-12	1194	145	145
6-Feb-12	1175	179	179
7-Feb-12	1150	170	170
8-Feb-12	1168	185	185
9-Feb-12	1198	177	177
10-Feb-12	1160	116	116
11-Feb-12	1173	162	162
12-Feb-12	1187	176	176
13-Feb-12	1200	175	175
14-Feb-12	1194	180	180
15-Feb-12	1200	159	159
16-Feb-12	1230	179	179
17-Feb-12	1202	181	181
18-Feb-12	1200	184	184
19-Feb-12	1225	V 193	193
20-Feb-12	1180	177	177
21-Feb-12	1193	181	181
22-Feb-12	1211	182	182
23-Feb-12	1230	180	180
24-Feb-12	1170	176	176
25-Feb-12	1173	186	186
26-Feb-12	1180	186	186
27-Feb-12	1192	173	173
28-Feb-12	1205	181	181
29-Feb-12	1133	189	189

## RECEVEL

MAR 1 5 2012

Cavity 1050

UIC BRANCH EPA, REGION 5

Feb-12 Monthly Averages

Injection Pressure (psi)

1189

Injection Flow (gpm)

173

Return Flow (gpm)

173

Maximum Injection Pressure and corresponding Injection Flow

Date 16-Feb-12 Injection Pressure (psi) 1230

Injection Flow (gpm)

179

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

29-Feb-12

189

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

19-Feb-12

193

1225

Cavity 1050 Pressures & Flow Rates

## RECEIVED

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1200

1100

1000

Pressure (psig) or Flow Rate (gpm) (Thousands)

◁

◁

Þ

A-A-A-A A A A

1400

1300

1500

## UC BRANCH EPA, REGION 5 26-Feb-12 Injection Pressure 21-Feb-12 EPA Limit 16-Feb-12 Date 11-Feb-12 -- #--- Injection Flow 1-Feb-12 27-Jan-12 800 700 600 500 400 300 200 100 900

MAR 1 5 2012

UIC BRANCH EPA, REGION 5

CAVITY 1060

MAR 1 5 2012

Cavity 1060

Daily Averages

## UIC BRANCH

Date	Injection Pressure	Injection Flow	Return A.
	(psi)	(gpm)	(gpm)
1-Feb-12	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in
15-Feb-12	shut in	shut in	shut in
16-Feb-12	shut in	shut in	shut in
17-Feb-12	shut in	shut in	shut in
18-Feb-12	shut in	shut in	shut in
19-Feb-12	shut in	shut in	shut in
20-Feb-12	shut in	shut in	shut in
21-Feb-12	shut in	shut in	shut in
22-Feb-12	shut in	shut in	shut in
23-Feb-12	shut in	shut in	shut in
24-Feb-12	shut in	shut in	shut in
25-Feb-12	shut in	shut in	shut in
26-Feb-12	shut in	shut in	shut in
27-Feb-12	shut in	shut in	shut in
28-Feb-12	shut in	shut in	shut in
29-Feb-12	shut in	shut in	shut in

MAR 1 5 2012

UCBRANCH EPA, REGION 5

CAVITY 2030

MAR 1 5 2012

Cavity 2030

Daily Averages

### **UIC BRANCH**

EPA, REGION 5

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Feb-12	1193	304	304
2-Feb-12	1173	308	308
3-Feb-12	1183	313	313
4-Feb-12	1200	295	295
5-Feb-12	1194	280	280
6-Feb-12	1175	251	251
7-Feb-12	1150	268	268
8-Feb-12	1168	297	297
9-Feb-12	1198	258	258
10-Feb-12	1160	176	176
11-Feb-12	1173	238	238
12-Feb-12	1187	243	243
13-Feb-12	1200	245	245
14-Feb-12	1194	300	300
15-Feb-12	1200	257	257
16-Feb-12	1230	275	275
17-Feb-12	1202	259	259
18-Feb-12	1200	258	258
19-Feb-12	1194	253	253
20-Feb-12	1180	281	281
21-Feb-12	1193	296	296
22-Feb-12	1211	306	306
23-Feb-12	1230	298	298
24-Feb-12	1170	297	297
25-Feb-12	1173	290	290
26-Feb-12	1180	277	277
27-Feb-12	1192	271	271
28-Feb-12	1205	V327	327
29-Feb-12	1133	290	290



MAR I 5 2012

Cavity 2030

UIC BRANCH EPA, REGION 5

Feb-12 Monthly Averages

Injection Pressure (psi)

1188

Injection Flow (gpm)

276

Return Flow (gpm)

276

Maximum Injection Pressure and corresponding Injection Flow

Date

16-Feb-12

Injection Pressure (psi)

Injection Flow (gpm)

275

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

29-Feb-12

1133

290

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

28-Feb-12

327

1205

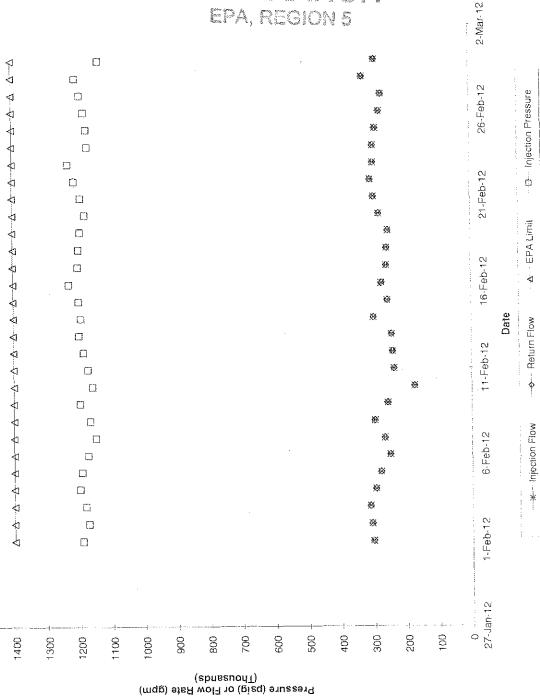
Cavity 2030 Pressures & Flow Rates

1500

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### UIC BRANCH EPA, REGION 5

CAVITY 2040

MAR 1 5 2012

Cavity 2040

Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Feb-12	shut in	shut in	shut in
2-Feb-12	shut in	shut in	shut in
3-Feb-12	shut in	shut in	shut in
4-Feb-12	shut in	shut in	shut in
5-Feb-12	shut in	shut in	shut in
6-Feb-12	shut in	shut in	shut in
7-Feb-12	shut in	shut in	shut in
8-Feb-12	shut in	shut in	shut in
9-Feb-12	shut in	shut in	shut in
10-Feb-12	shut in	shut in	shut in
11-Feb-12	shut in	shut in	shut in
12-Feb-12	shut in	shut in	shut in
13-Feb-12	shut in	shut in	shut in
14-Feb-12	shut in	shut in	shut in
15-Feb-12	shut in	shut in	shut in
16-Feb-12	shut in	shut in	shut in
17-Feb-12	shut in	shut in	shut in
18-Feb-12	shut in	shut in	shut in
19-Feb-12	shut in	shut in	shut in
20-Feb-12	shut in	shut in	shut in
21-Feb-12	shut in	shut in	shut in
22-Feb-12	shut in	shut in	shut in
23-Feb-12	shut in	shut in	shut in
24-Feb-12	shut in	shut in	shut in
25-Feb-12	shut in	shut in	shut in
26-Feb-12	shut in	shut in	shut in
27-Feb-12	shut in	shut in	shut in
28-Feb-12	shut in	shut in	shut in
29-Feb-12	-shut in	shut in	shut in

MAR 1 5 2012

UCBRANCH EPA: REGION 5

**CAVITY 2061** 



MAR I 5 2012

Cavity 2061

Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Feb-12	1193	117	117
2-Feb-12	1173	123	123
3-Feb-12	1183	114	114
4-Feb-12	1200	98	98
5-Feb-12	1194	92	92
6-Feb-12	1175	107	107
7-Feb-12	1150	89	89
8-Feb-12	1168	108	108
9-Feb-12	1198	135	135
10-Feb-12	1160	86	86
11-Feb-12	1173	158	158
12-Feb-12	1187	<b>√</b> 306	306
13-Feb-12	1200	130	130
14-Feb-12	1194	137	137
15-Feb-12	1200	125	125
16-Feb-12	1230	122	122
17-Feb-12	1202	115	115
18-Feb-12	1200	257	257
19-Feb-12	1194	119	119
20-Feb-12	1180	120	120
21-Feb-12	1193	124	124
22-Feb-12	1211	116	116
23-Feb-12	/1230	107	107
24-Feb-12	1170	136	136
25-Feb-12	1173	128	128
26-Feb-12	1180	108	108
27-Feb-12	1192	159	159
28-Feb-12	1205	137	137
29-Feb-12	1133	117	117



MAR 1 5 2012

Cavity 2061

UIC BRANCH EPA, REGION 5

Feb-12 Monthly Averages

Injection Pressure (psi)

1188

Injection Flow (gpm)

131

Return Flow (gpm)

131

Maximum Injection Pressure and corresponding Injection Flow

Date

16-Feb-12

Injection Pressure (psi)

1230

Injection Flow (gpm)

122

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

29-Feb-12

1133

117

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (psi)

Injection Pressure (psi)

12-Feb-12

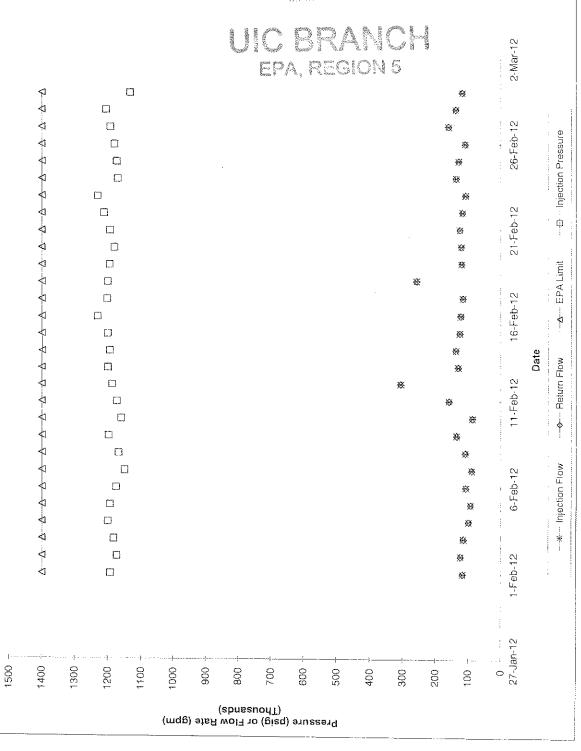
306

1187

Cavity 2061 Pressures & Flow Rates

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MAR 1 5 2012



MAR 1 5 2012

UC BRANCH EPA, REGION 6

CAVITY 2062

MAR 1 5 2012

Cavity 2062

Daily Averages

## UIC BRANCH

			FPA	REGIONS
	Injection	Injection	Return	A Comment
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Feb-12	shut in	shut in	shut in	
2-Feb-12	shut in	shut in	shut in	
3-Feb-12	shut in	shut in	shut in	
4-Feb-12	shut in	shut in	shut in	
5-Feb-12	shut in	shut in	shut in	
6-Feb-12	shut in	shut in	shut in	
7-Feb-12	shut in	shut in	shut in	
8-Feb-12	shut in	shut in	shut in	
9-Feb-12	shut in	shut in	shut in	
10-Feb-12	shut in	shut in	shut in	
11-Feb-12	shut in	shut in	shut in	
12-Feb-12	shut in	shut in	shut in	
13-Feb-12	shut in	shut in	shut in	
14-Feb-12	shut in	shut in	shut in	
15-Feb-12	shut in	shut in	shut in	
16-Feb-12	shut in	shut in	shut in	
17-Feb-12	shut in	shut in	shut in	
18-Feb-12	shut in	shut in	shut in	
19-Feb-12	shut in	shut in	shut in	
20-Feb-12	shut in	shut in	shut in	
21-Feb-12	shut in	shut in	shut in	
22-Feb-12	shut in	shut in	shut in	
23-Feb-12	shut in	shut in	shut in	
24-Feb-12	shut in	shut in	shut in	
25-Feb-12	shut in	shut in	shut in	
26-Feb-12	shut in	shut in	shut in	
27-Feb-12	shut in	shut in	shut in	
28-Feb-12	shut in	shut in	shut in	
29-Feb-12	shut in	shut in	shut in	



March 12, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU - 16J Chicago, IL 60604

Attn: Lisa Perenchio

Subj: Class I - Non-Hazardous Disposal Well

Monthly Report for February 2012

Permit No: MI-133-11-001



MAR 1 5 2012

UIC BRANCH EPA, REGION 5

Attached are the injection pressure, flowrate and annulus pressure records and cumulative volumes for the Woodward 1 - 26 disposal well. The daily minimum differentials are also included as a separate table. The annulus system is a closed system. Annulus fluid losses are attached. During the month no waste streams other than those identified in Part III (F) of the permit were injected into the well.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please call me at (231) 832-8800 if you have any guestions.

Sincerely,

Doug Patulski

Minefield Superintendent

Attachments

Karl Tomaszewski

Site Manager



### Woodward 1-26 Disposal Well

MAR I & 2012

Feb-12 Maximum values for injection pressure with corresponding values for flow rates and annulus pressure.

	Injection	Injection	Annulus
Date	Pressure	Flow	Pressure
	(psi)	(gpm)	(psi)
1-Feb-12	665	112	1683
2-Feb-12	669	117	1381
3-Feb-12	680	115	1675
4-Feb-12	717	126	1625
5-Feb-12	715	131	1265
6-Feb-12	715	120	1678
7-Feb-12	690	112	1638
8-Feb-12	747	132	1284
9-Feb-12	675	103	1691
10-Feb-12	653	149	1660
11-Feb-12	678	102	1705
12-Feb-12	674	105	1714
13-Feb-12	689	128	1450
14-Feb-12	660	119	1722
15-Feb-12	676	111	1325
16-Feb-12	695	140	1433
17-Feb-12	709	142	1348
18-Feb-12	696	119	1705
19-Feb-12	682	107	1304
20-Feb-12	674	112	1349
21-Feb-12	703	129	1634
22-Feb-12	668	116	1616
23-Feb-12	662	114	1755
24-Feb-12	663	105	1698
25-Feb-12	678	111	1652
26-Feb-12	715	129	1210
27-Feb-12	√ 749	√ 158	1379
28-Feb-12	644	109	1224
29-Feb-12	669	120	1573

### Woodward 1-26 Disposal Well

MAR 1 5 2012

Feb-12 Minimum values for injection pressure with corresponding values for flow rates and annulus pressure.

Date	Injection Pressure (psi)	Injection Flow (gpm)	Annulus Pressure (psi)
1-Feb-12	581	121	1326
2-Feb-12	621	122	1400
3-Feb-12	589	110	1528
4-Feb-12	666	109	1317
5-Feb-12	632	117	1640
6-Feb-12	648	139	1316
7-Feb-12	659	131	1348
8-Feb-12	652	119	1530
9-Feb-12	627	103	1398
10-Feb-12	599	120	1618
11-Feb-12	655	113	1429
12-Feb-12	635	108	1709
13-Feb-12	636	109	1504
14-Feb-12	635	106	1553
15-Feb-12	654	118	1733
16-Feb-12	661	121	1349
17-Feb-12	642	116	1717
18-Feb-12	658	102	1361
19-Feb-12	656	111	1592
20-Feb-12	630	130	1834
21-Feb-12	525	129	1480
22-Feb-12	623	116	1516
23-Feb-12	629	112	1339
24-Feb-12	618	122	1220
25-Feb-12	653	100	1638
26-Feb-12	671	135	1697
27-Feb-12	602	95	1513
28-Feb-12	605	103	# 1201
29-Feb-12	605	101	1716



#### Woodward 1-26 Disposal Well

MAR 1 5 2012

Feb-12 Minimum Differential Pressures between simultaneous measurements of injection pressure and annulus pressure. (Minimum Differential Pressure Allowed: 100 psi)

	Annuluo	Injection	Minimum
Data	Annulus Pressure	Injection Pressure	Differential Pressure
Date	(psi)	(psi)	(psi)
45140			612
1-Feb-12	1267	655	
2-Feb-12	1306	625	681
3-Feb-12	1507	678	829
4-Feb-12	1317	666	651
5-Feb-12	1265	715	550
6-Feb-12	1325	661	664
7-Feb-12	1348	659	689
8-Feb-12	1284	747	537
9-Feb-12	1292	659	633
10-Feb-12	1488	635	853
11-Feb-12	1246	675	571
12-Feb-12	1583	644	939
13-Feb-12	1450	· 689	761
14-Feb-12	1283	649	634
15-Feb-12	1325	676	649
16-Feb-12	12 <b>9</b> 3	668	625
17-Feb-12	1348	709	639
18-Feb-12	1279	675	604
19-Feb-12	1304	682	622
20-Feb-12	1266	674	592
21-Feb-12	1310	656	654
22-Feb-12	1499	653	846
23-Feb-12	1273	640	633
24-Feb-12	1220	618	602
25-Feb-12	1211	667	544
26-Feb-12	1210	715	* 495
27-Feb-12	1176	665	511
28-Feb-12	1224	644	NA
29-Feb-12	1425	668	NA

#### Woodward 1-26 Disposal Well

### Cumulative Volume (Gallons)

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UC BRANCH EPA, REGION 5

Disposal through

Jan-12

3,212,022,631

Disposal in

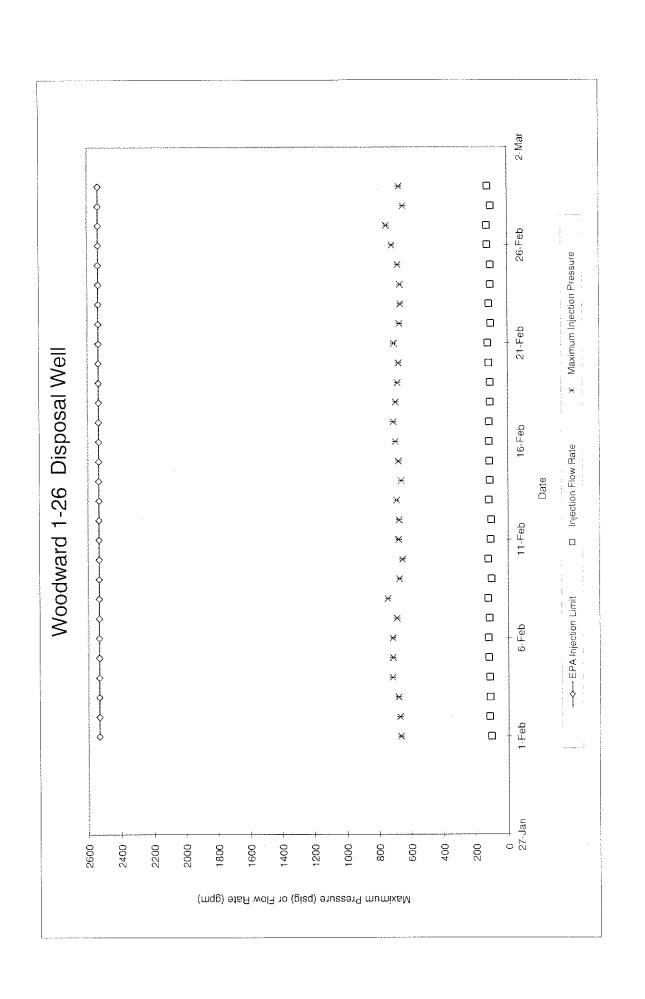
Feb-12

4,786,944

Cumulative volume through

29-Feb-12

3,216,809,575



		Woodward 1-2	26	
		Disposal Well Annulus /	Additions	
2012-2015			<u> </u>	
<u>Date</u>	Gallons	Type of Liquid	<u>Cumulative Volume</u>	Comments
2012 - January	none			
2012 - February	none			
				:
	<u> </u>		:	
				·
				:



March 12, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU - 16J Chicago, IL 60604

Attn: Lisa Perenchio

Subj: Class I - Non-Hazardous Disposal Well

Monthly Report for February 2012

Permit No: MI-133-11-002



MAR 1 5 2012

UIC BRANCH EPA, REGION 5

Attached are the injection pressure, flowrate and annulus pressure records and cumulative volumes for the Thomas 1 - 26 disposal well. The daily minimum differentials are also included as a separate table. The annulus system is a closed system. Annulus fluid losses are attached. During the month no waste streams other than those identified in Part III (F) of the permit were injected into the well.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Please call me at (231) 832-8800 if you have any questions.

Sincerely.

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments



### Thomas 1-26 Disposal Well

MAR 1 5 2012

Feb-12 Maximum values for injection pressure with corresponding values for flow rates and annulus pressure.

UCBRANCH

			Annulus and
	Injection	Injection	Annulus 🚾 🔭
Date	Pressure	Flow	Pressure
	(psi)	(gpm)	(psi)
1-Feb-12	682	417	1389
2-Feb-12	685	428	1397
3-Feb-12	700	415	1384
4-Feb-12	735	464	1470
5-Feb-12	728	452	1400
6-Feb-12	730	446	1575
7-Feb-12	703	425	1609
8-Feb-12	761	494	1621
9-Feb-12	688	382	1619
10-Feb-12	687	410	1645
11-Feb-12	688	400	1497
12-Feb-12	686	400	1582
13-Feb-12	705	456	1430
14-Feb-12	673	458	1186
15-Feb-12	692	430	1459
16-Feb-12	709	476	1453
17-Feb-12	725	484	1399
18-Feb-12	707	430	1598
19-Feb-12	694	408	1556
20-Feb-12	686	398	1232
21-Feb-12	718	467	1596
22-Feb-12	684	411	1414
23-Feb-12	<b>6</b> 75	430	1501
24-Feb-12	677	373	1623
25-Feb-12	687	399	1330
26-Feb-12	<i>∤</i> 731	453	1292
27-Feb-12	<b>√</b> 764	<b>√</b> 537	1226
28-Feb-12	656	404	1313
29-Feb-12	684	449	1384



### Thomas 1-26 Disposal Well

MAR 1 5 2012

Feb-12 Minimum values for injection pressure with corresponding values for flow rates and annulus pressure.

UC BRANCH

			The state of the s	
Date	Injection Pressure	Injection Flow	Annulus Pressure	EPA, REGION 5
	(psi)	(gpm)	(psi)	
1-Feb-12	600	449	1500	
2-Feb-12	640	446	1275	
3-Feb-12	633	436	1357	
4-Feb-12	680	380	1417	
5-Feb-12	650	381	1268	
6-Feb-12	665	471	1600	
7-Feb-12	675	459	1349	
8-Feb-12	667	430	1405	
9-Feb-12	640	451	1405	
10-Feb-12	609	435	1552	
11-Feb-12	563	404	1276	
12-Feb-12	647	420	1588	
13-Feb-12	649	412	1508	
14-Feb-12	651	396	1595	
15-Feb-12	680	438	1259	
16-Feb-12	675	423	, 1249	
17-Feb-12	657	390	1520	
18-Feb-12	667	395	1322	
19-Feb-12	668	394	1265	
20-Feb-12	649	463	1568	
21-Feb-12	541	489	1442	
22-Feb-12	637	387	1335	
23-Feb-12	645	412	1417	
24-Feb-12	631	416	1313	
25-Feb-12	667	375	1530	
26-Feb-12	684	434	1614	
27-Feb-12	611	471	1601	
28-Feb-12	618	342	1600	
29-Feb-12	619	375	1596	



Feb-12 Minimum Differential Pressures between simultaneous measurements of injection pressure and annulus pressure.
(Minimum Differential Pressure Allowed: 100 psi)

MAR 1 5 2012

UIC BRANCH

EPA, REGIONS

Date	Annulus Pressure (psi)	Injection Pressure (psi)	Minimum Differential Pressure (psi)
1-Feb-12	1181	673	508
2-Feb-12	1275	640	635
3-Feb-12	1384	700	684
4-Feb-12	1470	735	735
5-Feb-12	1200	725	475
6-Feb-12	1296	703	593
7-Feb-12	1349	675	674
8-Feb-12	1171	731	ø 440
9-Feb-12	1208	673	535
10-Feb-12	1552	609	943
11-Feb-12	1363	666	697
12-Feb-12	1372	657	715
13-Feb-12	1430	705	725
14-Feb-12	1186	673	513
15-Feb-12	1259	680	579
16-Feb-12	1249	675	574
17-Feb-12	1399	725	674
18-Feb-12	1164	688	476
19-Feb-12	1142	691	451
20-Feb-12	1163	680	483
21-Feb-12	1324	710	614
22-Feb-12	1335	637	698
23-Feb-12	1233	672	561
24-Feb-12	1151	672	479
25-Feb-12	1154	678	476
26-Feb-12	1238	706	532
27-Feb-12	1226	764	462

656

681

28-Feb-12

29-Feb-12

1313

1333

657

652

#### Thomas 1-26 Disposal Well

Cumulative Volume (Gallons)

# 

MAR 1 5 2012

Disposal through

Jan-12

3,564,600,967

Disposal in

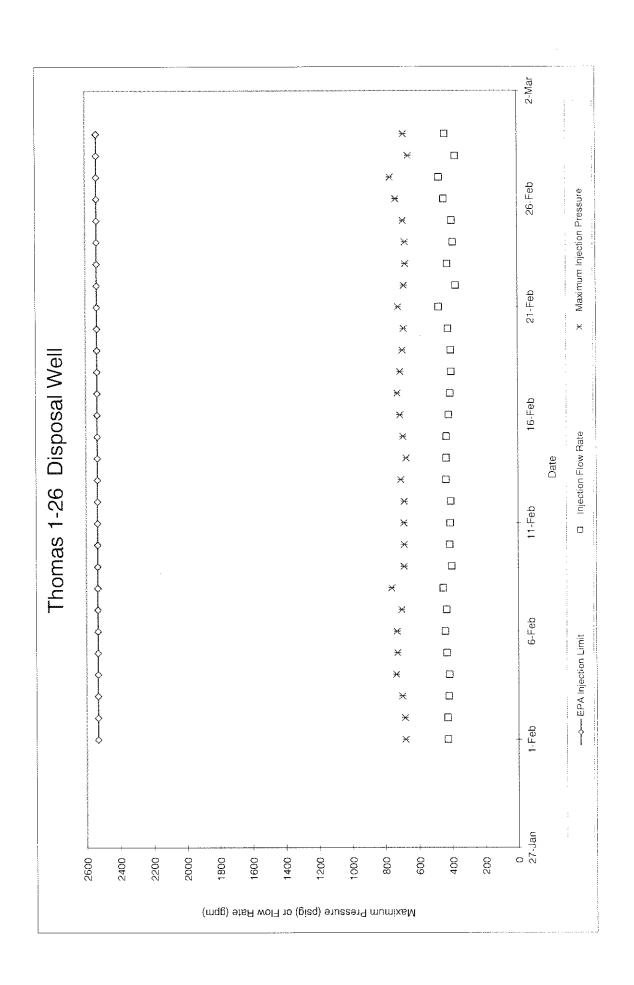
Feb-12

17,648,016

Cumulative volume through

29-Feb-12

3,582,248,983



		Thomas 1-26			
	Disposal Well Annulus Additions				
2012-2015					
<u>Date</u>	Gallons	Type of Liquid	Cumulative Volume	Comments	
2012 - January	none				
2012 - February	none				
				·	



February 13, 2012

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU – 16J Chicago, IL 60604

Attn: L

Lisa Perenchio

RE:

Class III Solution Mining Wells
Permit No. MI-133-3G-A002
Monthly Report for January 2012



FFB 2 9 2012

UIC BRANCH EPA, REGION 5

During the month of January, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 7 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCl 1050 was in operation for 30 days this month.
- Cavity KCI 1060 was in operation for 25 days this month.
- Cavity KCI 2030 was in operation for 31 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCl 2061 was in operation for 28 days this month.
- Cavity KCl 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 3. Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely.

Doug Patulski

Minefield Superintendent

Karl Tomaszewski Site Manager

Attachments

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#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-12	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in



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UC BRANCH Epa, regions

#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	 (gpm)
1-Jan-12	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in
20-Jan-12	1055	<b>339</b>	336
21-Jan-12	1058	320	319
22-Jan-12	1088	317	299
23-Jan-12	1170	289	284
24-Jan-12	<b>1188</b>	80	144
25-Jan-12	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in
30-Jan-12	1110	233	261
31-Jan-12	1081	243	257



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Jan-12 Monthly Averages

Injection Pressure (psi)

1107

Injection Flow (gpm)

260

Return Flow (gpm)

271

Maximum Injection Pressure and corresponding Injection Flow

Date

24-Jan-12

Injection Pressure (psi)

1188

Injection Flow (gpm)

80

Minimum Injection Pressure and corresponding Injection Flow

Date 20-Jan-12 Injection Pressure (psi)

Injection Flow (gpm)

1055

339

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

20-Jan-12

Injection Flow (gpm)

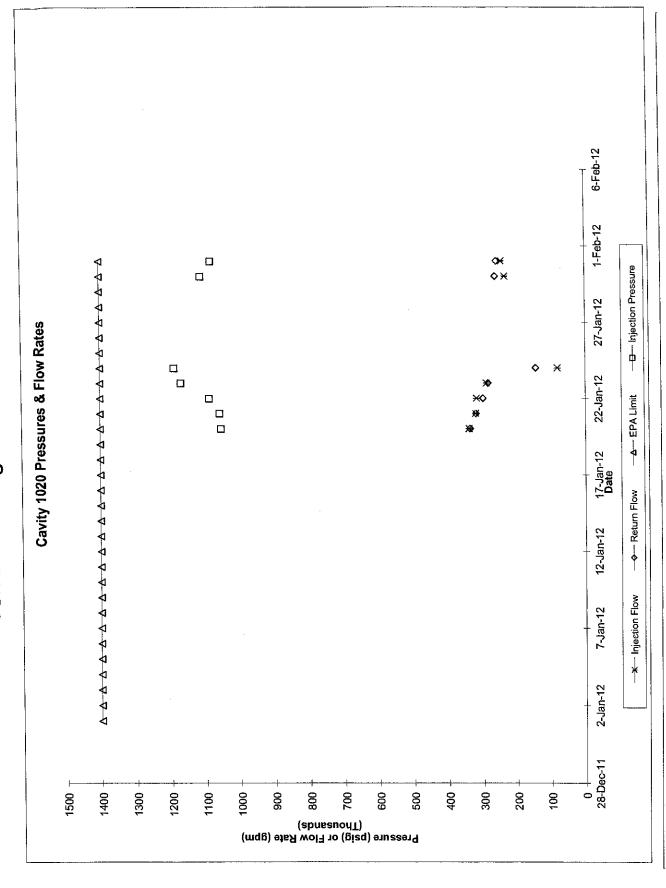
339

Injection Pressure (psi)

1055



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#### Daily Averages

Date	Injection Pressure	Injection Flow	Return Flow
Date	(psi)	(gpm)	(gpm)
1-Jan-12	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut ir
21-Jan-12	shut in	shut in	shut ir
22-Jan-12	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut ir
24-Jan-12	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut it
30-Jan-12	shut in	shut in	shut ii
31-Jan-12	shut in	shut in	shut ii



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#### **Daily Averages**

Date	Injection Pressure	Injection Flow	Return Flow
	(psi)	(gpm)	(gpm)
1-Jan-12	1190	164	164
2-Jan-12	1205	188	188
3-Jan-12	1200	189	189
4-Jan-12	1200	200	200
5-Jan-12	1200	184	184
6-Jan-12	1214	165	165
7-Jan-12	1200	153	153
8-Jan-12	1227 ✓	193	193
9-Jan-12	1213	183	183
10-Jan-12	1213	164	164
11-Jan-12	1208	150	150
12-Jan-12	1225	199	199
13-Jan-12	1200	180	180
14-Jan-12	1200	179	179
15-Jan-12	1183	150	150
16-Jan-12	1197	193	193
17-Jan-12	1221	178	178
18-Jan-12	1180	67	67
19-Jan-12	shut in	shut in	shut in
20-Jan-12	1188	194	194
21-Jan-12	1225	188	188
22-Jan-12	1204	183	183
23-Jan-12	1220	197	197
24-Jan-12	1210	141	141
25-Jan-12	1200	197	197
26-Jan-12	1225	197	197
27-Jan-12	1195	179	179
28-Jan-12	1210	171	171
29-Jan-12	1203	189	189
30-Jan-12	1175	190	190
31-Jan-12	1206	152	152



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Jan-12 Monthly Averages

Injection Pressure (psi) 1205

Injection Flow (gpm)

Return Flow (gpm)

175

175

Maximum Injection Pressure and corresponding Injection Flow

Date 8-Jan-12 Injection Pressure (psi)

Injection Flow (gpm)

1227

193

Minimum Injection Pressure and corresponding Injection Flow

Date 30-Jan-12 Injection Pressure (psi)

Injection Flow (gpm) 190

1175

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

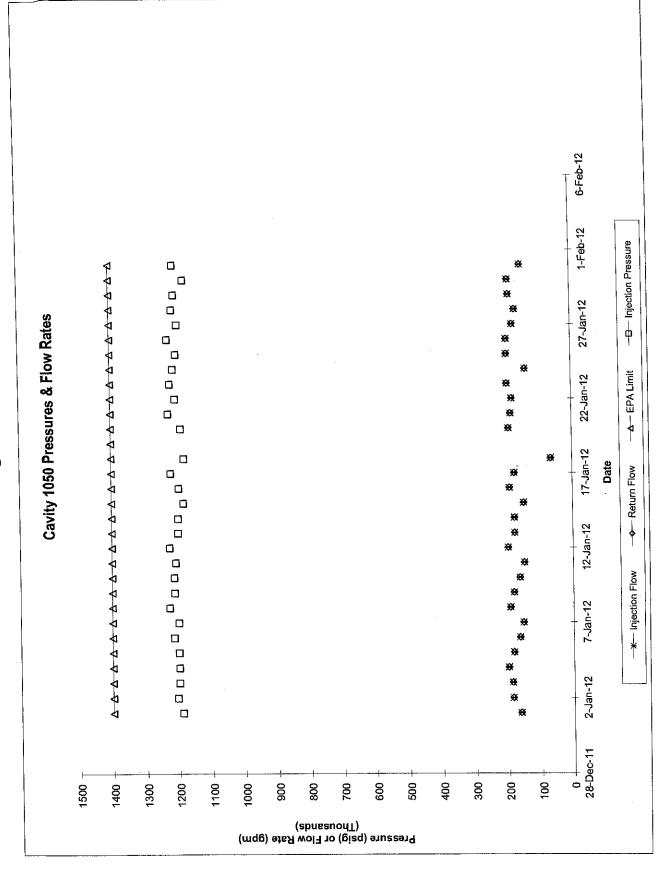
Injection Flow (gpm)

Injection Pressure (psi)

1200

4-Jan-12

200



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#### **Daily Averages**

Date	Injection Pressure	Injection	Return Flow
4.1.40	(psi)	(gpm)	(gpm)
1-Jan-12	1153	347	351
2-Jan-12	1123	340	360
3-Jan-12	1131	333	356
4-Jan-12	1151	347	329
5-Jan-12	1153	347	341
6-Jan-12	1161	354	379
7-Jan-12	1150	333	350
8-Jan-12	1150	375	390
9-Jan-12	1152	361	370
10-Jan-12	1162	375	378
11-Jan-12	1165	368	381
12-Jan-12	1170	382	394
13-Jan-12	1154	340	350
14-Jan-12	1154	368	374
15-Jan-12	1158	361	369
16-Jan-12	1170	375	379
17-Jan-12	1168	361	366
18-Jan-12	1170	361	373
19-Jan-12	1149	347	372
20-Jan-12	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in
23-Jan-12	shut in	shut in /	shut in
24-Jan-12	1141	396 √	415
25-Jan-12	1140	347	369
26-Jan-12	1133	389	369
27-Jan-12	1156	333	363
28-Jan-12	1157	368	370
29-Jan-12	1146	361	371
30-Jan-12	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in



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Jan-12 Monthly Averages

Injection Pressure

1153

Injection Flow

359

Return Flow

369

Maximum Injection Pressure and corresponding Injection Flow

Date 12-Jan-12 Injection Pressure

1170

Injection Flow

382

Minimum Injection Pressure and corresponding Injection Flow

Date 2-Jan-12

Injection Pressure

1123

Ye-M'

Injection Flow

340

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

24-Jan-12

Injection Flow

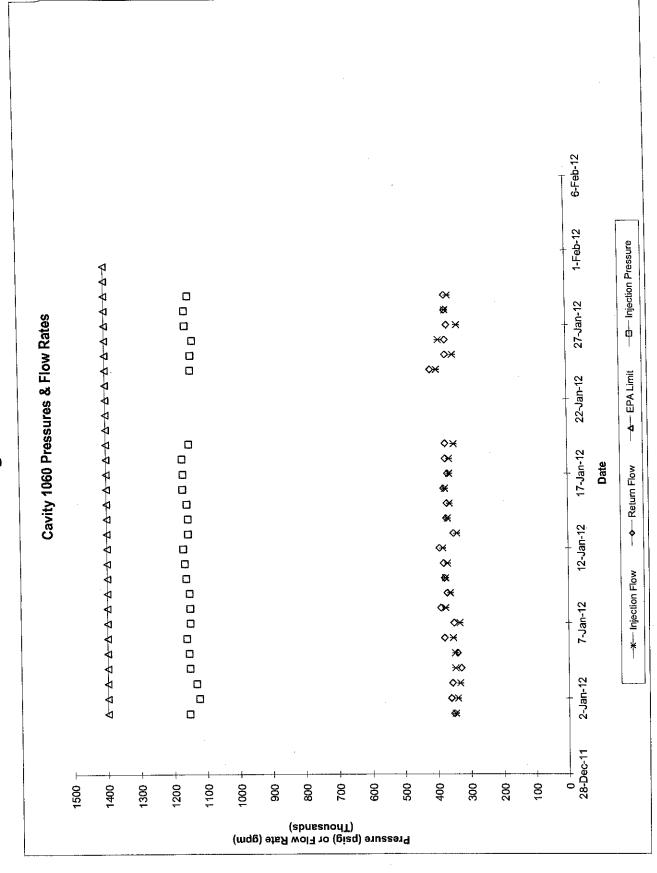
396

Injection Pressure

1141



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Cavity 2030

#### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Jan-12	1190	274	274
2-Jan-12	1205	250	250
3-Jan-12	1200	250	250
4-Jan-12	1200	254	254
5-Jan-12	1200	277	277
6-Jan-12	1214	274	274
7-Jan-12	1200	250	250
8-Jan-12	1227	274	274
9-Jan-12	1213	237	237
10-Jan-12	1213	255	255
11-Jan-12	1208	257	257
12-Jan-12	1225	263	263
13-Jan-12	1200	174	174
14-Jan-12	1200	233	233
15-Jan-12	1183	242	242
16-Jan-12	1197	253	253
17-Jan-12	1221	273	273
18-Jan-12	1210	268	268
19-Jan-12	1208	319	319
20-Jan-12	1188	260	260
21-Jan-12	1225	235	235
22-Jan-12	1204	264	264
23-Jan-12	1220	250	250
24-Jan-12	1210	269	269
25-Jan-12	1200	233	233
26-Jan-12	1211	233	233
27-Jan-12	1195	280	280
28-Jan-12	1210	278	278
29-Jan-12	1203	304	304
30-Jan-12	1175	250	250
31-Jan-12	1206	297	297



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Jan-12 Monthly Averages

Injection Pressure (psi)

1205

Injection Flow (gpm)

259

Return Flow (gpm)

259

Maximum Injection Pressure and corresponding Injection Flow

Date 8-Jan-12 Injection Pressure (psi) 1227 Injection Flow (gpm)

274

i.

Date 30-Jan-12

Injection Pressure (psi)

Minimum Injection Pressure and corresponding Injection Flow

Injection Flow (gpm)

1175

250

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

Injection Flow (gpm)

Injection Pressure (psi)

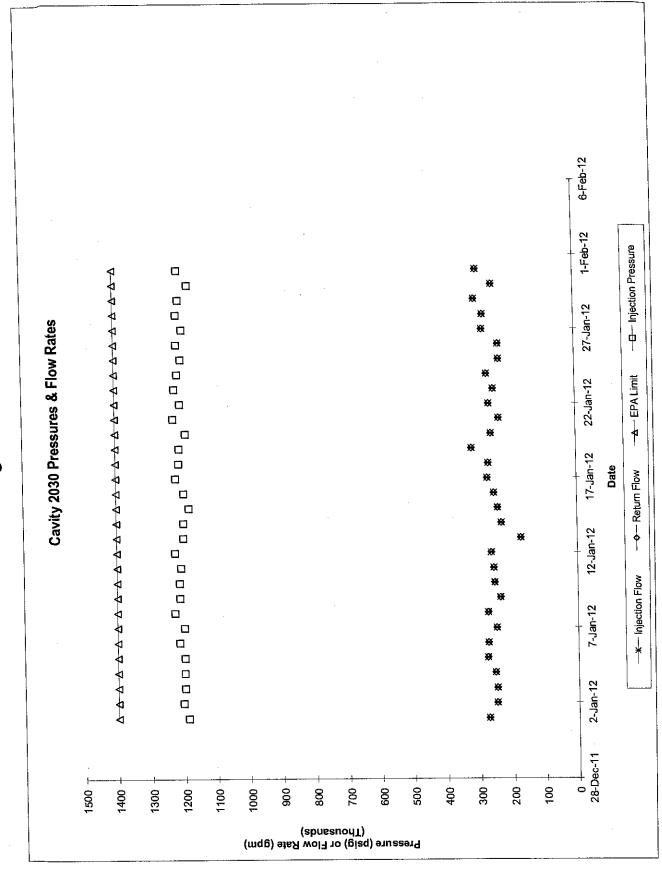
19-Jan-12

319

1208



FEB 2 9 2012



FEB 2 2 2012 LETA, RECOLORS

#### **Daily Averages**

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-12	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in



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Cavity 2061

#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-12	1190	176	176
2-Jan-12	1205	166	166
3-Jan-12	1200	158	158
4-Jan-12	1200	167	167
5-Jan-12	1200	173	173
6-Jan-12	1214	149	149
7-Jan-12	1200	129	129
8-Jan-12	1227	130	130
9-Jan-12	1213	117	117
10-Jan-12	1213	163	163
11-Jan-12	1208	134	134
12-Jan-12	1225	122	122
13-Jan-12	1200	156	156
14-Jan-12	1200	119	119
15-Jan-12	1183	106	106
16-Jan-12	1197	127	127
17-Jan-12	1221	99	99
18-Jan-12	1210	158	158
19-Jan-12	1208	222	222
20-Jan-12	1188	172	172
21-Jan-12	1225	126	126
22-Jan-12	1204	170	170
23-Jan-12	1220	146	146
24-Jan-12	1210	118	118
25-Jan-12	1200	89	89
26-Jan-12	1211	89	89
27-Jan-12	1195	98	98
28-Jan-12	1210	85	85
29-Jan-12	1203	98	98
30-Jan-12	1175	179	179
31-Jan-12	1206	117	117



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Jan-12 Monthly Averages

Injection Pressure (psi)

1205

Injection Flow (gpm)

137

Return Flow (gpm)

137

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

8-Jan-12

1227

130

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

30-Jan-12

1175

179

Maximum Injection Flow Rate and corresponding Injection Pressure

Date 19-Jan-12 Injection Flow (psi)

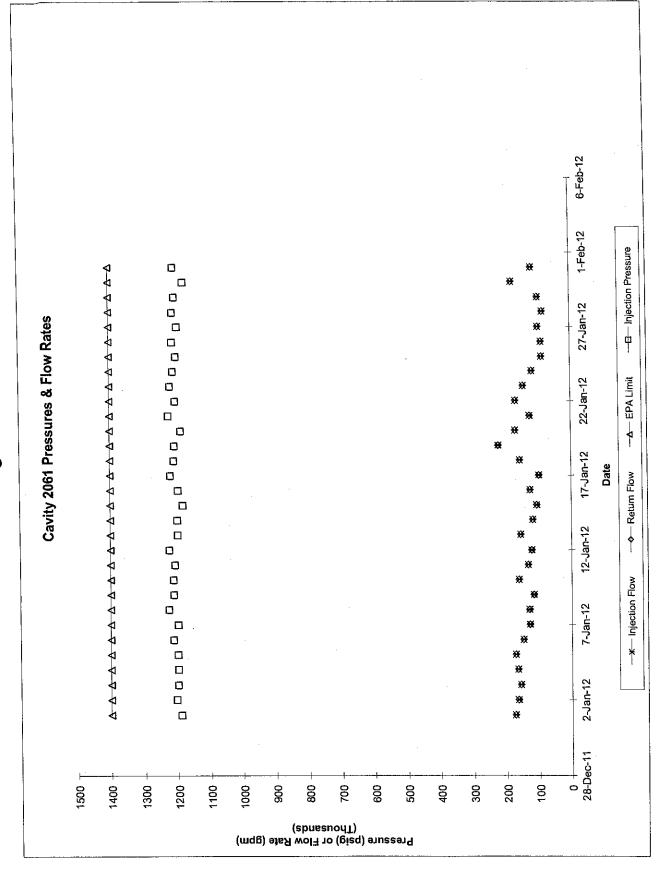
Injection Pressure (psi)

222

1208



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#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Jan-12	shut in	shut in	shut in
2-Jan-12	shut in	shut in	shut in
3-Jan-12	shut in	shut in	shut in
4-Jan-12	shut in	shut in	shut in
5-Jan-12	shut in	shut in	shut in
6-Jan-12	shut in	shut in	shut in
7-Jan-12	shut in	shut in	shut in
8-Jan-12	shut in	shut in	shut in
9-Jan-12	shut in	shut in	shut in
10-Jan-12	shut in	shut in	shut in
11-Jan-12	shut in	shut in	shut in
12-Jan-12	shut in	shut in	shut in
13-Jan-12	shut in	shut in	shut in
14-Jan-12	shut in	shut in	shut in
15-Jan-12	shut in	shut in	shut in
16-Jan-12	shut in	shut in	shut in
17-Jan-12	shut in	shut in	shut in
18-Jan-12	shut in	shut in	shut in
19-Jan-12	shut in	shut in	shut in
20-Jan-12	shut in	shut in	shut in
21-Jan-12	shut in	shut in	shut in
22-Jan-12	shut in	shut in	shut in
23-Jan-12	shut in	shut in	shut in
24-Jan-12	shut in	shut in	shut in
25-Jan-12	shut in	shut in	shut in
26-Jan-12	shut in	shut in	shut in
27-Jan-12	shut in	shut in	shut in
28-Jan-12	shut in	shut in	shut in
29-Jan-12	shut in	shut in	shut in
30-Jan-12	shut in	shut in	shut in
31-Jan-12	shut in	shut in	shut in



FEB 9 9 2012



November 9, 2012



NOV 1 5 2012

UIC BRANCH

United States Environmental Protection Agency Underground Injection Control Enforcement Unit, Region 5 77 W. Jackson, WU - 16J Chicago, IL 60604

Attn:

Lisa Perenchio

RE: Class III Solution Mining Wells Permit No. MI-133-3G-A002 Monthly Report for October 2012

During the month of October, Mosaic Potash solution well operations were as follows:

- Cavity KCI 1010 was not in operation for this month.
- Cavity KCI 1020 was in operation for 31 days this month.
- Cavity KCI 1040 was not in operation for this month.
- Cavity KCI 1050 was in operation for 31 days this month.
- Cavity KCI 1060 was in operation for 29 days this month.
- Cavity KCI 2030 was in operation for 31 days this month.
- Cavity KCI 2040 was not in operation for this month.
- Cavity KCI 2061 was in operation for 31 days this month.
- Cavity KCI 2062 was not in operation for this month.

Workover records are sent under separate cover by Doug Patulski, Minefield Superintendent.

Attached are the following reports for Cavities KCI 1010, KCI 1020, KCI 1040, KCI 1050, KCI 1060, KCI 2030, KCI 2040, KCI 2061, and KCI 2062:

- 1. Graphs showing Injection Pressure, Injection Flowrate, and Return Flowrate.
- Daily Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- Monthly Averages for Injection Pressure, Injection Flowrate, and Return Flowrate.
- 4. Maximum and Minimum Injection Pressure and Corresponding Flowrates.
- 5. Maximum Injection Flowrate and Corresponding Injection Pressure.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Sincerely,

Doug Patulski

Minefield Superintendent

Karl Tomaszewski

Site Manager

Attachments



NOV 1 5 2012

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NOV 1 5 2012

### Daily Averages

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Oct-12	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in
30-Oct-12	shut in	shut in	shut in
31-Oct-12	shut in	shut in	shut in



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Cavity 1020

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
/1-Oct-12	/1149	322	384
2-Oct-12	1044	252	339
3-Oct-12	1044	137	219
4-Oct-12	1052	75	107
5-Oct-12	1075	73	100
6-Oct-12	1013	76	104
7-Oct-12	1035	81	105
8-Oct-12	1075	92	111
9-Oct-12	1069	107	115
10-Oct-12	1075	88	122
11-Oct-12	1087	86	111
12-Oct-12	1111	87	163
13-Oct-12	1096	89	69
14-Oct-12	1086	92	127
15-Oct-12	1076	92	122
16-Oct-12	1077	89	120
17-Oct-12	1102	100	133
18-Oct-12	1075	102	122
19-Oct-12	1081	100	116
20-Oct-12	1101	114	122
21-Oct-12	1108	100	132
22-Oct-12	1095	97	124
23-Oct-12	1101	95	120
24-Oct-12	1098	99	129
25-Oct-12	1114	92	95
26-Oct-12	1129	93	108
27-Oct-12	1125	99	127
28-Oct-12	1123	115	124
29-Oct-12	1092	110	168
30-Oct-12	1083	133	164
31-Oct-12	1074	144	187



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Oct-12

Monthly Averages

Injection Pressure (psi) 1086 Injection Flow (gpm) 111 Return Flow (gpm)

142

Maximum Injection Pressure and corresponding Injection Flow

Date 1-Oct-12 Injection Pressure (psi)

Injection Flow (gpm)

1149

322

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

6-Oct-12

1013

76

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

1-Oct-12

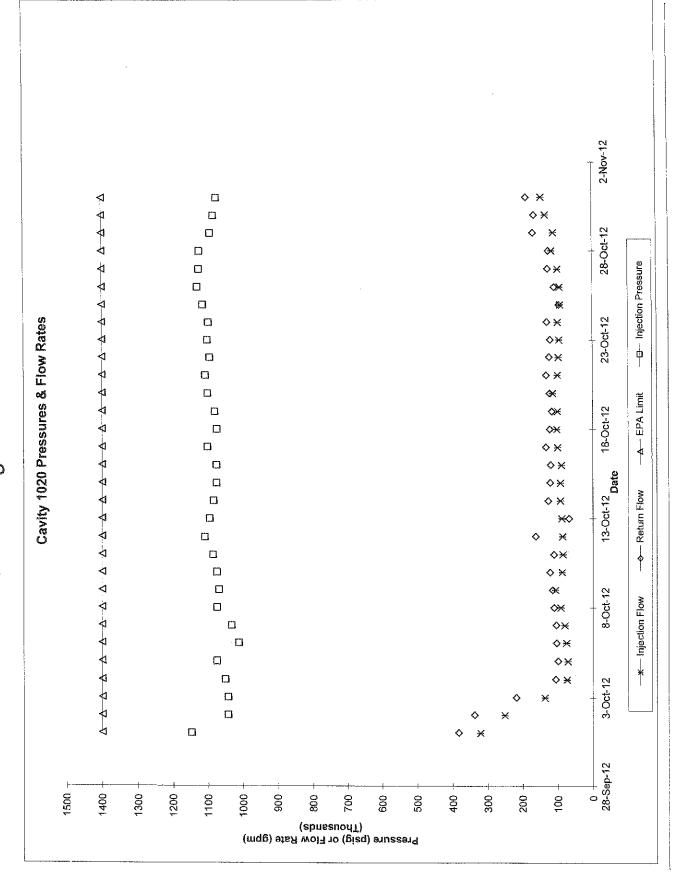
Injection Flow (gpm)

Injection Pressure (psi)

1149

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### Daily Averages

	Injection	Injection	Return	
Date	Pressure	Flow	Flow	
	(psi)	(gpm)	(gpm)	
1-Oct-12	shut in	shut in	shut in	
2-Oct-12	shut in	shut in	shut in	
3-Oct-12	shut in	shut in	shut in	
4-Oct-12	shut in	shut in	shut in	
5-Oct-12	shut in	shut in	shut in	
6-Oct-12	shut in	shut in	shut in	
7-Oct-12	shut in	shut in	shut in	
8-Oct-12	shut in	shut in	shut in	
9-Oct-12	shut in	shut in	shut in	
10-Oct-12	shut in	shut in	shut in	
11-Oct-12	shut in	shut in	shut in	
12-Oct-12	shut in	shut in	shut in	
13-Oct-12	shut in	shut in	shut in	
14-Oct-12	shut in	shut in	shut in	
15-Oct-12	shut in	shut in	shut in	
16-Oct-12	shut in	shut in	shut in	
17-Oct-12	shut in	shut in	shut in	
18-Oct-12	shut in	shut in	shut in	
19-Oct-12	shut in	shut in	shut in	
20-Oct-12	shut in	shut in	shut in	
21-Oct-12	shut in	shut in	shut in	
22-Oct-12	shut in	shut in	shut in	
23-Oct-12	shut in	shut in	shut in	
24-Oct-12	shut in	shut in	shut in	
25-Oct-12	shut in	shut in	shut in	
26-Oct-12	shut in	shut in	shut in	
27-Oct-12	shut in	shut in	shut in	
28-Oct-12	shut in	shut in	shut in	
29-Oct-12	shut in	shut in	shut in	
30-Oct-12	shut in	shut in	shut in	
31-Oct-12	shut in	shut in	shut in	



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UC BRANCH EPAREGIONS

Cavity 1050

Date	Injection Pressure (psi)	Injection Flow (gpm)	Return Flow (gpm)
1-Oct-12	1177	166	166
2-Oct-12	1170	169	169
3-Oct-12	1170	166	166
4-Oct-12	1113	173	173
5-Oct-12	1153	163	163
6-Oct-12	1215	173	173
7-Oct-12	1188	157	157
8-Oct-12	1183	163	163
9-Oct-12	1205	165	165
10-Oct-12	1173	156	156
11-Oct-12	1195	169	169
12-Oct-12	1200	182	182
13-Oct-12	1158	180	180
14-Oct-12	1183	175	175
15-Oct-12	1175	161	161
16-Oct-12	1195	154	154
17-Oct-12	1138	170	170
18-Oct-12	1117	177	177
19-Oct-12	1165	157	157
20-Oct-12	1120	175	175
21-Oct-12	1140	172	172
22-Oct-12	1160	158	158
23-Oct-12	1143	154	154
24-Oct-12	1188	139	139
25-Oct-12	1180	134	134
26-Oct-12	1158	176	176
27-Oct-12	1150	173	173
28-Oct-12	1128	170	170
29-Oct-12	1145	134	134
30-Oct-12	1180	97	97
31-Oct-12	1140	144	144



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Oct-12 V Monthly Averages

Injection Pressure (psi) 1165 Injection Flow (gpm)

Return Flow (gpm) 161

161

Maximum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi) 1215 Injection Flow (gpm)

6-Oct-12

173

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure (psi)

Injection Flow (gpm)

4-Oct-12

1113

173

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

12-Oct-12

Injection Flow (gpm)

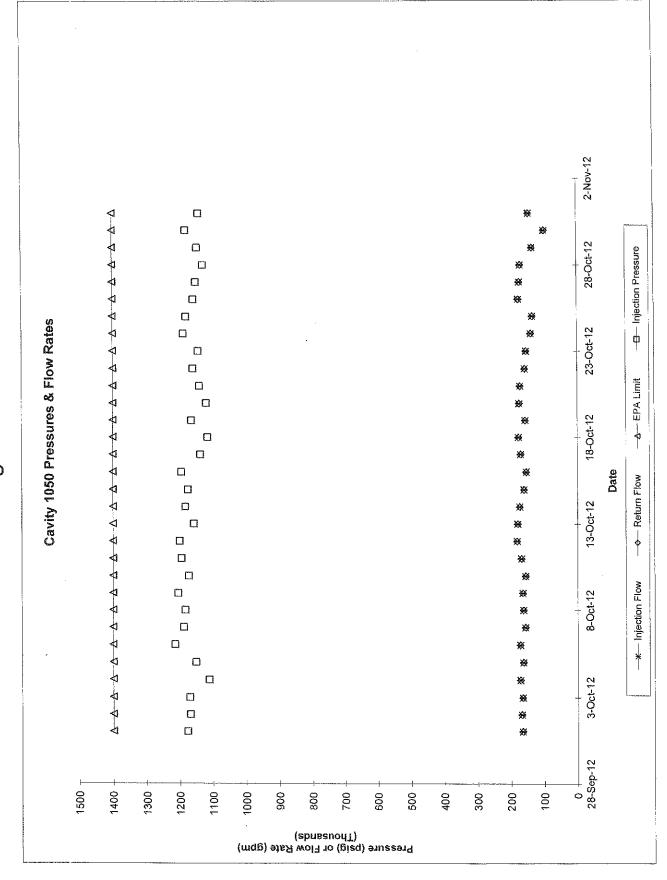
Injection Pressure (psi)

1200

182

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## / CAVITY 1060

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HOMBER OIL

Cavity 1060

Date	Injection Pressure (psi)	Injection Flow	Return Flow (gpm)
		(gpm)	
1-Oct-12	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in
3-Oct-12	1044	300	237
4-Oct-12	1052	340	288
5-Oct-12	1075	313	301
6-Oct-12	1014	354	321
7-Oct-12	1035	333	320
8-Oct-12	1075	319	295
9-Oct-12	1069	292	273
10-Oct-12	1075	285	296
11-Oct-12	1087	299	279
12-Oct-12	1111	285	286
13-Oct-12	1096	278	288
14-Oct-12	1086	271	279
15-Oct-12	1076	299	284
16-Oct-12	1077	264	274
17-Oct-12	1102	271	280
18-Oct-12	1075	271	306
19-Oct-12	1081	278	238
20-Oct-12	1101	271	272
21-Oct-12	1088	278	294
22-Oct-12	1095	271	275
23-Oct-12	1101	278	272
24-Oct-12	1098	278	270
25-Oct-12	1114	236	246
26-Oct-12	V1129	278	271
27-Oct-12	1125	271	269
28-Oct-12	1123	264	275
29-Oct-12	1091	257	256
30-Oct-12	1082	236	230
31-Oct-12	1074	243	269



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Oct-12 Monthly Averages

Injection Pressure 1085 Injection Flow 283 Return Flow 277

Maximum Injection Pressure and corresponding Injection Flow

Date 26-Oct-12 Injection Pressure 1129 Injection Flow

278

Minimum Injection Pressure and corresponding Injection Flow

Date

Injection Pressure

Injection Flow

6-Oct-12

1014

354

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

6-Oct-12

Injection Flow

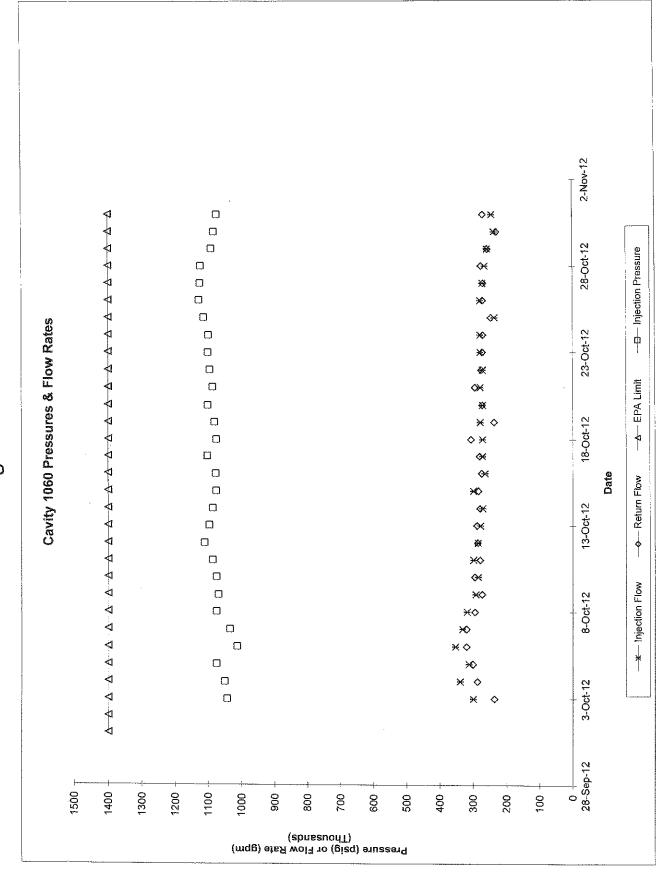
354

Injection Pressure

1014



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Cavity 2030

Date	Injection Pressure (psi)	Injection Elow (gpm)	Return Flow (gpm)
7 1-Oct-12	1177	279	279
2-Oct-12	1170	277	277
3-Oct-12	1170	274	274
4-Oct-12	1113	275	275
5-Oct-12	1153	286	286
6-Oct-12	V1215	283	283
7-Oct-12	1188	298	298
8-Oct-12	1183	261	261
9-Oct-12	1205	275	275
10-Oct-12	1173	266	266
11-Oct-12	1195	287	287
12-Oct-12	1200	288	288
13-Oct-12	1158	271	271
14-Oct-12	1183	270	270
15-Oct-12	1175	287	287
16-Oct-12	1195	288	288
17-Oct-12	1138	285	285
18-Oct-12	1117	283	283
19-Oct-12	1165	284	284
20-Oct-12	1120	270	270
21-Oct-12	1110	290	290
22-Oct-12	1160	283	283
23-Oct-12	1143	272	272
24-Oct-12	1188	275	275
25-Oct-12	1180	232	232
26-Oct-12	1158	250	250
27-Oct-12	1150	276	276
28-Oct-12	1128	277	277
29-Oct-12	1145	285	285
30-Oct-12	1180	282	282
31-Oct-12	1140	278	278



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Oct-12 Monthly Averages

Injection Pressure (psi)

Injection Flow (gpm)

Return Flow (gpm)

1164

277

277

Maximum Injection Pressure and corresponding Injection Flow

Date 6-Oct-12 Injection Pressure (psi) 1215

Injection Flow (gpm)

283

Minimum Injection Pressure and corresponding Injection Flow

Date 21-Oct-12 Injection Pressure (psi)

Injection Flow (gpm)

1110

290

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

7-Oct-12

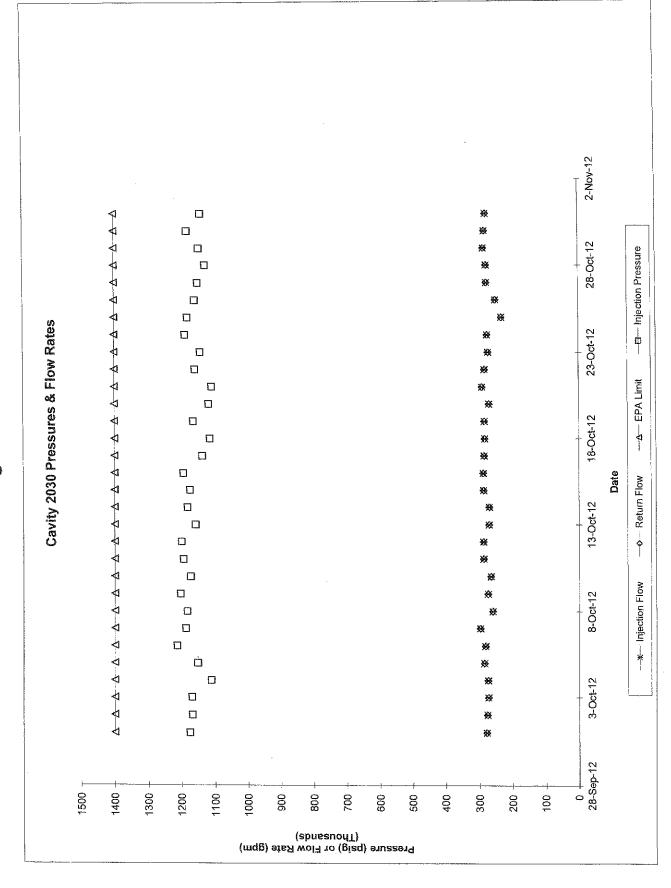
Injection Flow (gpm) 298

Injection Pressure (psi)

1188



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## √ CAVITY 2040

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UC BRANCH Era regions

### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Oct-12	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in
29-Oct-12	shut in	- shut in	shut in
30-Oct-12	shut in	shut in	shut in
31-Oct-12	✓ shut in	shut in	shut in



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Cavity 2061

	Injection	Injection Flow	Return
Date	Pressure		Flow
	(psi)	(gpm)	(gpm)
1-Oct-12	1177	112	112
2-Oct-12	1170	113	113
3-Oct-12	1170	89	89
4-Oct-12	1113	V 145	145
5-Oct-12	1153	135	135
6-Oct-12	√ 1215	140	140
7-Oct-12	1188	123	123
8-Oct-12	1183	141	141
9-Oct-12	1205	124	124
10-Oct-12	1173	142	142
11-Oct-12	1195	117	117
12-Oct-12	1200	111	111
13-Oct-12	1158	110	110
14-Oct-12	1183	108	108
15-Oct-12	1175	105	105
16-Oct-12	1195	115	115
17-Oct-12	1138	105	105
18-Oct-12	1117	113	113
19-Oct-12	1165	129	129
20-Oct-12	1120	120	120
21-Oct-12	1110	116	116
22-Oct-12	1160	113	113
23-Oct-12	1143	108	108
24-Oct-12	1188	96	96
25-Oct-12	1180	84	84
26-Oct-12	1158	112	112
27-Oct-12	1150	113	113
28-Oct-12	1128	92	92
29-Oct-12	1145	103	103
30-Oct-12	1180	115	115
31-Oct-12	1140	108	108



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Oct-12 Monthly Averages

Injection Pressure (psi)

1164

Injection Flow (gpm)

115

Return Flow (gpm)

115

Maximum Injection Pressure and corresponding Injection Flow

Date 6-Oct-12 Injection Pressure (psi)

Injection Flow (gpm)

1215

140

Minimum Injection Pressure and corresponding Injection Flow

Date

21-Oct-12

Injection Pressure (psi) 1110

Injection Flow (gpm)

116

Maximum Injection Flow Rate and corresponding Injection Pressure

Date

4-Oct-12

Injection Flow (psi)

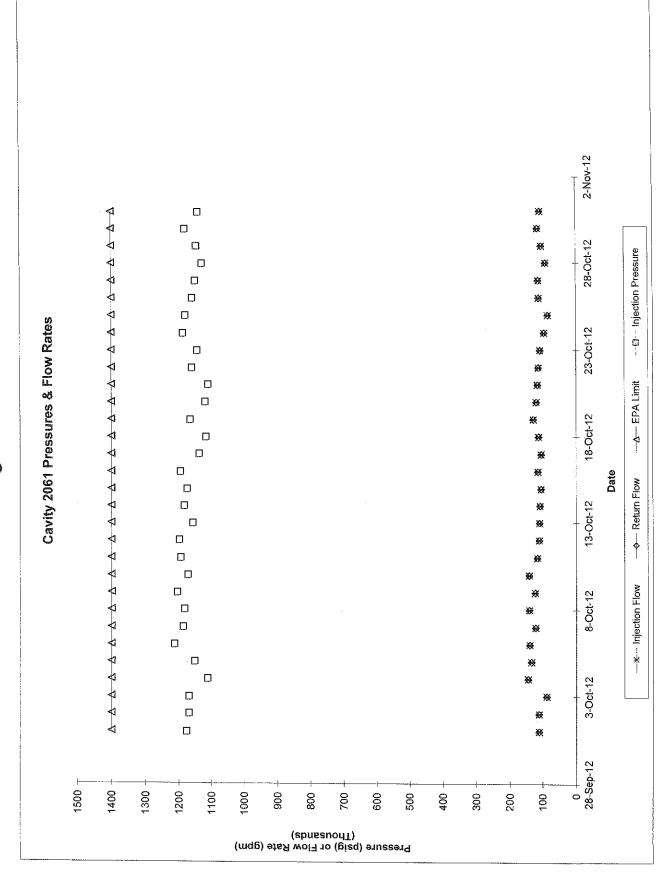
145

Injection Pressure (psi)

1113



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#### Daily Averages

	Injection	Injection	Return
Date	Pressure	Flow	Flow
	(psi)	(gpm)	(gpm)
1-Oct-12	shut in	shut in	shut in
2-Oct-12	shut in	shut in	shut in
3-Oct-12	shut in	shut in	shut in
4-Oct-12	shut in	shut in	shut in
5-Oct-12	shut in	shut in	shut in
6-Oct-12	shut in	shut in	shut in
7-Oct-12	shut in	shut in	shut in
8-Oct-12	shut in	shut in	shut in
9-Oct-12	shut in	shut in	shut in
10-Oct-12	shut in	shut in	shut in
11-Oct-12	shut in	shut in	shut in
12-Oct-12	shut in	shut in	shut in
13-Oct-12	shut in	shut in	shut in
14-Oct-12	shut in	shut in	shut in
15-Oct-12	shut in	shut in	shut in
16-Oct-12	shut in	shut in	shut in
17-Oct-12	shut in	shut in	shut in
18-Oct-12	shut in	shut in	shut in
19-Oct-12	shut in	shut in	shut in
20-Oct-12	shut in	shut in	shut in
21-Oct-12	shut in	shut in	shut in
22-Oct-12	shut in	shut in	shut in
23-Oct-12	shut in	shut in	shut in
24-Oct-12	shut in	shut in	shut in
25-Oct-12	shut in	shut in	shut in
26-Oct-12	shut in	shut in	shut in
27-Oct-12	shut in	shut in	shut in
28-Oct-12	shut in	shut in	shut in
29-Oct-12	shut in	shut in	shut in
30-Oct-12	shut in	shut in	shut in
31-Oct-12	shut in	shut in	shut in

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